COAL AGE

Established 1911—McGraw-Hill Publishing Company, Inc.

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

SYDNEY A. HALE, *Editor*

New York, October, 1934

Too Fast

WITH the natural desire of labor to improve its position through higher wages and shorter working hours, progressive management can have no just quarrel if the objective can be attained without restrictive burdens on production costs. But the wisdom of attempting to push too fast or too far is open to serious question. This is particularly true in the bituminous fields, where organized labor has made such gigantic strides during the past year. Readjustment to the new conditions thus created is by no means complete, and the situation with respect to competition from other fuels is still acute. Under these circumstances, the renewed demands of labor leaders for the thirty-hour week seem ill-timed and out of tune.

Massed Forces

BITUMINOUS COAL is bringing up its heavy artillery in the fight against federal hydro-electric projects which threaten to take away millions of tons and to rob thousands of workers of their normal means of livelihood. The steady drum fire of the National Coal Association, the National Job Saving Bureau and other agencies which have been riddling the proposals to use government funds for developing new power in areas already amply supplied has been followed up with a broadside from the first-named organization assailing the entire water-power program of the present national administration and pointing out the effect that program will have upon mining, transportation and related industries. Every million tons of coal displaced means the elimination of $2,000,000 in revenue freight, a loss of $1,000,000 in mine wages and the permanent closing down of hundreds of mines, which will turn communities dependent upon them into ghost settlements.

Defenders of the New Utopia may retort that the coal men have a very selfish interest in opposing hydro-electric expansion. The charge will be candidly, even cheerfully, admitted. But hurling that charge does not rebut the facts marshaled by the coal industry and its allies. That charge does not rebut the fact that the taxpayers, at a time when there is the most urgent necessity for creating new employment, are being asked to dig down into thin purses to finance projects which will create more unemployment. Vague promises that at some future and unnamed date these projects will raise the people to new plateaus of living offer too intangible recompense for the certainty of immediate losses.

Which Road?

BUSINESS, drained of much of its earlier enthusiasm for NRA and partially recovered from its bewilderment at the kaleidoscopic changes in national administration policies, is beginning to take earnest stock of the New Deal. Several groups representing influential industrial organizations already are canvassing the situation to determine a course for future action. A cross-section of opinion in the bituminous industry is given in an article beginning on page 380 of this issue, and operators will have an opportunity to declare their position when the subject is presented for discussion at the convention of the

National Coal Association in Washington later this month.

While it is not impossible that these various studies will develop major, and even irreconcilable, differences between the natural-resource industries and manufacturing enterprises on specific details of future relationships of government and business, all industry should be able to unite in supporting broad, basic principles. Indeed, such agreement and common purpose are imperative if industry is to maintain its rightful place in the national economic structure. What is needed, therefore, is not an alliance of business interests engaged in a futile attempt to turn the clock back but an alliance eager to hold fast to all that works for the national good and equally determined to fight for the destruction of those things which impede sound recovery.

Two-Edged

DEFENDERS of the rights of minorities and individuals are up in arms over the decision of the National Labor Relations Board in the *Houde Engineering Corporation* case, in which the board ruled that a representative chosen by a majority vote of the affected workers must be treated as "the exclusive collective bargaining agency" of all the employees involved. Organized labor has greeted the decision with loud applause and denounced those who have threatened to challenge the ruling in court. But non-partisan realists, insensible to the plight of the minorities, cannot overlook the fact that this ruling, if sound, is equally applicable in the plant where organized labor is numerically weaker than a company union or non-affiliated individualists.

Goose Killing

RAILROAD PROPOSALS for a general increase in freight rates will strike no responsive chord in the bosoms of coal producers or coal consumers. With substitute fuels pressing for advantage, with the federal government in open and direct competition with both carriers and operators through its hydro-electric program and with trucking of coal from the mines widening in radius and growing in tonnage, imposition of higher freight rates would drive more traffic off the rails. Both the carrier and the coal producer would lose. What is needed, as was stressed by Federal Coordinator of Transportation Eastman several months ago in his comments on the Interstate Commerce Commission report on railroad purchasing policies, is a reduction in coal rates that would help the mines meet the competition of other fuels and sources of power—and, incidentally, increase the tonnage moving over the rails of the steam carriers. Higher prices are a dangerous substitute for increased volume.

Wrexham Explosion

A DISASTER in Wales, with its 271 fatalities, calls attention once more to the fact that disasters in coal mines can be averted only by taking all necessary precautions. Too many mines, it is to be feared, in Great Britain, as in this country, lack the needed conditions for safety, which perhaps is explained by the fact that a gassy, dusty mine does not suggest hazard. A visitor to the mine, if he had not heard of mine explosions, would feel assured that the entry was a safe place except for the risk of a roof fall, of which danger he probably would be profoundly and uncomfortably conscious. And, indeed, the manager of a mine who has not had any explosion obtains the same assurance from every visit to his workings. Mine workings do not seem likely scenes of a holocaust. Only with an effort of recollection and imagination can he foresee just what is likely to happen if he neglects the precautions so manifestly proved by test, experiment and experience as necessary for safety.

Our present immunity from major accidents is phenomenal, and does not seem to be due solely to our precautions. When one notes some mines which have a coal-dust problem still not at all or inadequately rock-dusted, when one notes gassy mines operated without proper control of the volume and methane content of the mine air, when one sees evidence of leakage and recirculation of the air current, one cannot but feel that certain contingencies have not always been adequately safeguarded. The excellent examples set by many enlightened companies need more methodical and conscientious following by all mines. The most dangerous season for bituminous coal mining approaches with the advent of winter, and it is obligatory for all soft-coal operators to bear its dangers in mind.

TRAILER HAULAGE

+ Meets Efficiency and Capacity Demands

At Sinclair Strip Mines

By IVAN A. GIVEN
Assistant Editor, Coal Age

FROM a small beginning with light equipment about four years ago, the use of trucks and trailers for hauling coal at strip operations has steadily increased in the Southwest. With pioneering work demonstrating the feasibility of this method of haulage, improvements in automotive equipment and trailer design have increased capacity and efficiency to a point where a number of Southwestern strip plants have been planned around the use of trailer transportation. The Mark Twain mine of the Huntsville-Sinclair Mining Co., Huntsville, Mo., is a case in point. This operation served as the laboratory for the development of trailer haulage at the Sinclair properties, and its nine units now account for an average output of 1,600 tons per shift of seven hours. The round-trip haul is 7½ miles.

With experience at Mark Twain as a guide, trucks and trailers were installed in the No. 2 pit of the Seneca Coal & Coke Co., Broken Arrow, Okla., when it was opened in September, 1933. The four units in use haul from 1,000 to 1,100 tons per shift over a round-trip distance averaging 2 miles. Trailers were installed also at the No. 2 pit, Tiger mine, Hume-Sinclair Coal Mining Co., Tiger, Mo., in June, 1934. Tiger No. 2 was opened in July, 1930, and five trailer units (with an additional unit temporarily being held in reserve) went into operation in June, 1934, and will haul an average of 2,500 tons per shift over a round-trip distance averaging 2 miles when normal operation on the present shovel location is established in the near future. Broken Arrow No. 3 (900-1,000 tons per shift; average round-trip haul, 1½ miles) and Tiger No. 1 (1,800 tons per shift; average round-trip haul, 5½ miles) are operated with steam locomotives and cars.

Contrary to conditions at the general run of stripping operations, the Mark Twain tract is cut up by a number of small streams, leaving the stripping territory proper in the form of "islands." Both the Mulky (12-14 in.) and the Bevier (46 in.) seams are present on the tract, and the overburden, from the top down, consists of clay, 5 ft. of limestone and 4 ft. of black slate over the Mulky. Between the Mulky and the Bevier is 13 ft. of blue shale. Development at Mark Twain was started on March 1, 1932, and the first coal was loaded in June, trucks and trailers being used from the start for hauling coal.

Stripping operations originally were based on making cuts 60 to 70 ft. wide down to the Bevier seam with the 10-cu.yd. stripping shovel, beginning at the outcrop and working back until the over-

Fig. 1—View in the Pit at Mark Twain, Showing Cleaning Method and Loading Shovels at Work in the Mulky Seam.

Fig. 2—Loading Coal With Skimmer-Type Dipper at Broken Arrow No. 2.

Fig. 3—Trailer Haulage at Broken Arrow, Showing Road Construction.

burden reached a maximum depth of approximately 55 ft. Sixty-foot holes were drilled into the overburden under the Mulky seam in advance of the stripping unit by a horizontal drill, and dynamite and black powder were used to break it up. The Mulky coal was discarded with the rest of the spoil, and the Bevier coal was loaded, without blasting, by a 2¾-cu.yd. electric loading shovel. As the Bevier seam is divided into two benches by a 4-in. fireclay parting 10 in. above the bottom, actual loading operations have been based on first removing the upper 36-in. bench during the day shift, then stripping off the fireclay at night in preparation for loading the bottom 10 in. the next day.

Recover Mulky Seam Also

The high quality of the Mulky seam makes its recovery desirable, however, and stripping methods were revised with this end in view. At the present time, the Mulky is first stripped and loaded. When the stripping shovel reaches the end of the cut, it is reversed and digs down to the Bevier, returning along the line of the upper bench, the blue shale being deposited on top of the spoil bank from the upper bench and allowed to run down the slope opposite the cut.

Special spoil-transporting equipment is now being built to relieve the stripping unit of the task of removing the blue shale. When installed, the stripping unit will continue to uncover the Mulky as at present, and the coal will be loaded by a 1¼-cu.yd. gas-electric shovel. The stripping unit will be followed up by the 2¾-cu.yd. shovel now being used for loading coal, which will remove the blue shale and discharge it to the transporting unit for elevation to the top of the spoil bank left by the stripping shovel. The small shovel will then load the Bevier coal, adhering substantially to the system outlined above. In Fig. 1, both the small shovels are shown loading the Mulky seam. These units are working together only until the transporting equipment is installed.

Original haulage equipment at Mark Twain consisted of 2-ton trucks with 6-ton trailers of the company's own design. Three of these units are still in use, but will be discontinued in the near future in favor of 7½-ton trucks and 15-ton trailers, which were adopted as standard equipment in May, 1933. The six large and three small units, as indicated above and in Table I, haul an average of 1,600 tons per day. Maximum to date has been 2,200 tons in

Table I—Physical Conditions, Major Equipment and Output at Sinclair Strip Mines

	Mark Twain	Broken Arrow No. 2	Broken Arrow No. 3	Tiger No. 1	Tiger No. 2
Seams operated	Mulky / Bevier	Broken Arrow		Mulberry	
Average thickness, inches	M., 12-14 / B., 46	24		30	
Overburden, average thickness, feet	40[1]	22–23		35	
Stripping					
Elec. shovels, Bucyrus-Erie, 16-cu.yd.	.....	.....	.....	.....	1[4]
Marion, 10-cu.yd.	1	.....	.....	.....	.....
Marion, 9-cu.yd.	.....	.....	.....	1	.....
Steam shovels, Bucyrus-Erie, 7½-cu.yd.	.....	1	.....	.....	.....
Bucyrus-Erie, 6-cu.yd.	.....	.....	1	.....	.....
Loading					
Elec. shovels, Marion, 5-cu.yd.	.....	.....	.....	.....	1[3]
Marion, 2¾-cu.yd.	1	.....	.....	.....	.....
Bucyrus-Erie, 2¾-cu.yd.	.....	.....	.....	1	.....
Gas-elec. shovels, Marion, 1¼-cu.yd.	1	.....	.....	.....	.....
Steam shovels, Bucyrus-Erie, 2-yd.	.....	1	.....	.....	.....
Bucyrus-Erie, 1½-cu.yd.	.....	.....	1	.....	.....
Drilling—Overburden					
Horizontal drills, Sullivan	.....	.....	.....	1	1
Other horizontal drills	1	1	1	.....	.....
Cutting and Drilling—Coal					
Cutters	.....	1	1	1[4]	1[4]
Compressor units	.....	1	1	1[4]	1[4]
Haulage					
Trucks, Autocar, 7½-ton	5	.....	.....	.....	4[5]
Mack, 7½-ton	.....	.....	.....	.....	1
White, 7½-ton	.....	.....	.....	.....	1
Indiana, 7½-ton	1[6]	.....	.....	.....	.....
Autocar, 3½-ton	.....	2	.....	.....	.....
Indiana, 2-ton	3[7]	.....	.....	.....	.....
Ford, 2-ton	.....	2	.....	.....	.....
Trailers, United, 20-ton	.....	.....	.....	.....	1[8]
United, 18-ton	.....	.....	.....	.....	1
Sanford-Day, 15-ton	5	.....	.....	.....	4[9]
Fruehauf, 15-ton	1	.....	.....	.....	.....
Sanford-Day, 10-ton	.....	2	.....	.....	.....
Own make, 6-ton	3[7]	2	.....	.....	.....
Steam locomotives, 42-ton	.....	.....	.....	3	.....
20-ton	.....	.....	1	.....	.....
18-ton	.....	.....	1	.....	.....
Cars, Sanford-Day, 40-ton	.....	.....	.....	13[9]	.....
Sanford-Day, 15-ton	.....	.....	6	.....	.....
Average haul, round trip, miles	7½	2	1½	5½	2
Average output, 7 hours, tons	1,600	1,050	850	1,800[10]	2,500

[1]Maximum depth to Bevier, which is the bottom seam; interval between Mulky and Bevier, 13 ft. [2]With counterbalance. [3]Aluminum dipper, replacing original 3½-yd. steel dipper. [4]Used only when demand for lump is good, usually in winter. [5]Includes one spare. [6]Experimental diesel-engine unit. [7]To be replaced with 7½-ton trucks and 15-ton trailers. [8]Experimental aluminum unit. [9]Including three spares. [10]This pit operated on second shift; No. 2 operated on first shift.

seven hours over a round-trip distance of 7½ miles. Over this distance, average cost per ton of coal shipped (including depreciation in three years; interest on investment at 6 per cent; tire, gasoline and oil cost; maintenance; operating labor; and other charges) is 14c.

Both the No. 2 and No. 3 pits at the Broken Arrow mine originally were operated with steam locomotives and cars, No. 2 changing to trucks and trailers in September, 1933. The Broken Arrow seam, averaging 24 in. in thickness, is operated, and the average thickness of the overburden is 22-23 ft., varying from a minimum of 16 ft. to a maximum of 30 ft. Surface soil aggregates 2 to 16 ft., and is underlaid by 6 to 30 in. of limestone. Between the limestone and the coal is a stratum of shale.

Stripping equipment at the No. 2 pit consists of a steam shovel with a 7½-cu.yd. dipper, and the coal is loaded by a second steam shovel with a 2-cu.yd. "skimmer-type" bucket (Fig. 2). This type of dipper was adopted because of the thinness of the coal. A 6-cu.yd. steam shovel is employed in the No. 3 pit for stripping, and a second steam unit with a 1½-cu.yd. dipper, also of the skimmer type, for loading. Operation of both pits is based on making a stripping cut 65 ft. wide, the overburden being drilled 50 ft. in advance of the stripping units by horizontal drills and blasted with black or pellet powder—also used for breaking up the coal. Shortwall machines converted for vertical service are employed to cut the coal, which is drilled with pneumatic drills. Air for the latter is supplied by electrically driven portable compressor units.

Haulage equipment at Broken Arrow No. 2 consists of two 3½-ton trucks, each with 10-ton trailer, and two 2-ton trucks with 6-ton trailers. Each unit makes an average of 33 round trips per shift of seven hours. Minimum round-trip haul is 1 mile; maximum, 3 miles; average, 2 miles. Normal production of the pit is 1,000-1,100 tons in seven hours. Prior to the introduction of trucks and trailers, haulage equipment consisted of three 18-ton steam locomotives and 108 4½-ton end-dump pit cars. The average trip was 20 cars; maximum, 30 cars. Broken Arrow No. 3 is operated with two steam locomotives (one 18- and one 20-ton) and six 15-ton bottom-dump cars. Average round-trip haul is 1½ miles, and average production in seven hours is 800-900 tons. Cars are handled in trips of three.

Fig. 4—Stripping Unit With 16-Cu.Yd. Counterbalanced Dipper at Work in Tiger No. 2 Pit.

With the largest output, the No. 2 pit at the Tiger operation also has the largest stripping unit—an electric shovel with a 16-cu.yd. counterbalanced dipper. This unit makes 70-ft. cuts in the overburden over the Mulberry seam, which averages 30 in. in thickness and is the highest seam, geologically, in Missouri. Average thickness of the overburden over both the No. 2 and No. 1 pits is 35 ft., and, from the top down, it consists of surface soil and shale, the latter partaking strongly of the characteristics of a blue shale. Drilling in the overburden is performed by horizontal drills, which make 60-ft. holes 6 in. in diameter in front of the stripping units, and the burden is shot with 40-per cent gelatin. The stripping unit at the No. 1 pit is a 9-cu.yd. electric shovel. The width of the stripping cut in this pit averages 60 ft.

Blasting to break up the coal is a seasonal activity at the Tiger operation, being done usually only in the winter, when the demand for lump is good. As at the other two Sinclair operations, the coal is first cut with appropriate cutting machines and is then drilled with pneumatic drills which are supplied with air by electrically driven compressors. The electric coal-loading shovel in the No. 2 pit is equipped with a 5-cu.yd. aluminum dipper with hydraulic pitch changer to permit the pitch to be accommodated to variations in the thickness of the coal. Original equipment on the loading unit consisted of a 3½-cu.yd. all-steel dipper. The aluminum dipper is equipped with manganese-steel teeth and also with manganese-steel wearing strips on the bottom. During the six months this dipper has been in operation, no expense for repairs has been incurred. The loading unit at the No. 1 pit is a 2¾-cu.yd. electric shovel with horizontal booms.

Trucks Replace Locomotives

In June of this year, the three 42-ton steam locomotives and thirteen 40-ton standard-gage bottom-dump cars were transferred to the No. 1 pit, and six trucks and trailers were installed at No. 2. As pointed out above, five of the combined units are in operation, with one spare. Trucks are rated at 7½ tons, and the trailer equipment consists of four 15-ton units, one 18-ton unit and one 20-ton experimental aluminum unit. The extra capacity of the latter was obtained with no increase in weight over the 15-ton units. With all six trucks working, production from No. 2 pit will average 2,500 tons per shift of seven hours. Present haulage distance is 1¼ mile, round trip, but soon will average 2 miles on the territory now being developed by the stripping shovel.

The steam locomotives at the No. 1 pit also haul to the No. 2 preparation plant, which operates two shifts, the second shift being devoted to handling the tonnage from No. 1. Ten of the thirteen 40-ton cars are in use, with three in reserve, and trips consist of five cars each. Average round-trip haul is 5½ miles, and production averages 1,800 tons in seven hours. Use of the trucks on the second shift to haul from No. 1 is a possibility now being considered by the management.

Cleaning in the pit at Sinclair operations follows well-established principles. Wire brushes, supplemented by hand shoveling when necessary, are employed at the Mark Twain plant, while bulldozers and hand shoveling are standard equipment at Broken Arrow and Tiger.

Mark Twain is served by a McNally-Pittsburg tipple equipped with shaker screens, picking tables, loading booms and a one-cell Pittsburg-Montgomery jig for washing the 1¼-in. slack. A contract has been let for a Norton washer to replace the latter. This washer, with a capacity of 175 tons per hour, will

clean the minus 3-in. coal and will enable the plant to ship 1½-in. raw and washed screenings, ¼x1¼-in. raw and washed pea, 1¼x2-in. raw and washed nut, 2x3-in. raw and washed nut, 3x8-in. raw egg, 3-in. raw domestic lump, and mixtures as required. All sizes above 1¼ in. are boom loaded.

Both the No. 2 and No. 3 pits at Broken Arrow are served by separate plants, the former with a five-track tipple equipped with Marcus screens, picking tables and loading booms over three tracks, as well as a rescreening plant for the production of nut and chestnut. Standard sizes are: ¾-in. slack, 1¼x¾-in. chestnut, 2½x1¼-in. nut, and 6x2½-in. egg and 6-in. lump; also combinations. The second Broken Arrow preparation unit, for the No. 3 pit, is a three-track all-steel McNally - Pittsburg tipple equipped to load 1¼-in. slack, 1¼x2½-in. nut and 2½-in. lump.

As noted above, both Tiger No. 1 and No. 2 are served by the same preparation plant, which works two shifts. This plant, supplied by the United Iron Works Co., is arranged to ship 1¼-in. slack, 2x1¼-in. and 3x2-in. nut, and 10x3-in. furnace, as well as any other size desired. An order has been placed for a Norton washer, with a capacity of 150 tons per hour, which will be employed to clean the 1¼x6-in. size. It is expected that other units will be added later to clean everything.

Preparation practice at the three operations described in this article is distinguished by the fact that at all the plants the raw feed is first run through a crusher to reduce excessively large masses to a reasonable maximum measurement—12 in. at Mark Twain and Broken Arrow and 10 in. at Tiger. Additional crushing equipment has been installed at all plants except Broken Arrow No. 3 for breaking down the larger sizes in times of slack demand.

Trailers remain permanently coupled to the trucks, which are of the tractor type with dual rear wheels. Dumping is substantially similar in principle to the familiar bottom-dumping pit car, the bottom gates being opened when the unit is over the dump through the tripping of latches projecting out from one side of the trailer body. These latches normally rest in the bottom of stirrups attached to the trailer body (Fig. 6), but when the trailer starts over the dump they strike an inclined tripping rail, which raises them and in turn unlatches the doors. As the trailer leaves the dump, the doors ride over a roller which raises them into latching position, where they automatically lock. Cost of a complete unit, consisting of a 7½-ton truck and a 15-ton trailer, is approximately $7,200.

Roads, of course, are the backbone of trailer haulage, and as such have been the subject of careful study at the Sinclair properties. The first step is grading and draining. Where possible, gradients on main roads are held to a maximum of 5 per cent, although in certain cases short grades up to 8 per cent are allowed. A 30-ft. crown is standard. After grading, the road is surfaced with pickings or burnt shale from old deep-mine dumps to a depth of 6 in., followed in turn by 2 to 3 in. of river gravel. Regular maintenance with a power maintainer is then begun, and the road is run over usually for a few months to smooth out any irregularities.

The next step is to windrow the gravel to one side with the maintainer and oil with "60 asphalt" oil to make an "oil-mix" road. The oil must be applied during summer, when the heat will assure proper penetration. Approximately 1 gal. per square yard is required in two applications in the center of the crown. After each application, the power maintainer is used to mix the oil into the gravel. After the second application, the road is allowed to lie idle for five or six days, and is then ready for service. No further attention is then necessary, except for patching such holes as may appear, for about a year, whereupon the road is gone over with a scarifier to smooth it, and thereafter is treated with 1 qt. of oil per square yard of surface. It is then good for another year of service. Cost of average road of this type is $2,500 per mile, exclusive of bridges. Pneumatic tires are used to prevent cupping of the surface.

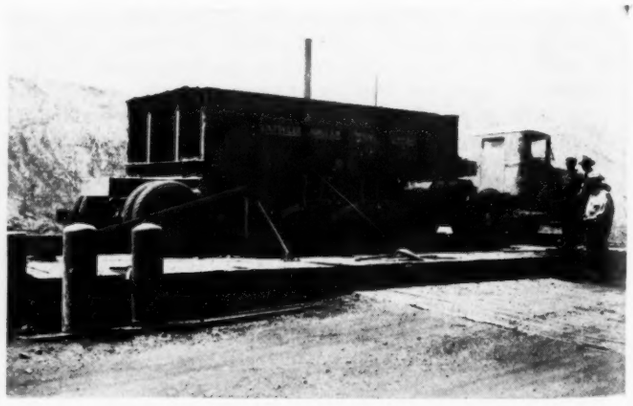
The spread of trailer operation at Southwestern strip mines reflects a number of advantages which have been proved out at the Sinclair properties here described. A major one is the elimination of tracklaying. This takes on added importance as the coal becomes thinner, as a reduction of half in the seam thickness, for example, doubles the quantity of track necessary for a given tonnage. Increased shovel operating time is another important benefit, which grows out of the fact that there is no delay in turning the stripping unit when it reaches the end of the cut to allow track to be removed; interference between haulage units is eliminated; and the presence of a good all-weather highway facilitates supervision by reducing the time required for traveling and enables maintenance or repair crews to reach machinery in the pit and also bring in heavy parts without difficulty. Supervision at Sinclair pits, it is calculated, has been made four times as effective by the introduction of trailer equipment.

The presence of a good highway also is a help in case of accident, as an injured man may be brought out or medical assistance taken to him without delay. Further operating advantages result from the fact that substandard territory can be left without interfering with routine operation. Also, it is possible to strip isolated areas that otherwise would have to be left, because the expense of building a track to them would be prohibitive.

Routine maintenance of trucks and trailers offers no particular difficulty. Trucks are washed often enough to keep them fairly clean at all times, and both trucks and trailers are oiled and greased every night by hostlers, who also check them for mechanical defects. Oil is changed every 500 miles or sooner, if required, the interval depending upon the quantity of dust encountered.

Fig. 5—Loading Coal at Tiger No. 2. This Loading Unit Is Equipped With a 50-Cu.Yd. Aluminum Dipper.

Fig. 6—Trailer Over the Dump at the Tiger Tipple, Showing Tripping Rail and Position of Latch Levers.



HOW NAOMI REBUILT

+ Its Tipple, Adding a Washer

And Replacing Its Incline With a Belt

WHEN, on July 27, 1930, the tipple of Naomi mine of the Hillman Coal & Coke Co., which is located on the Monongahela River at Fayette City, Pa., was burned to the ground, an opportunity was afforded to replace it by a structure of more modern design that would reduce labor costs, improve preparation, provide the required mixing facilities and later permit of coal washing. A coal area comprising about 250 acres of Pittsburgh seam 80 in. thick, including in that measurement only minable coal, still remained unextracted.

This coal was being conveyed by electric locomotives to the foot of the mine slope and lifted to the surface by endless wire-rope haulage. Thence it was conveyed a mile overland by an electrically driven head-and-tail-rope system. Although the headhouse had not been involved in the fire, a new one was constructed at the head of the old plane down which, up to that time, the loads had been lowered to the tipple and empties returned in trips of five mine cars each. A Fairbanks scale now weighs the cars in this headhouse before they are discharged by a Phillips crossover dump into a feed hopper, from which their coal flows onto a 6-ply belt by which it is carried down to the tipple.

By replacing the old plane with the belt the direct labor of seven men was eliminated, to say nothing of those employed in the repair of cars and track, for wrecking of cars is inevitable with the plane method of transportation. Operating continuously, there are no delays with a belt such as are inevitable with planes. Width of belt is 36 in.; length, 960 ft. between centers of head and tail pulleys; fall between headhouse and point of discharge is 126 ft.; capacity of belt 250 tons per hour, all run-of-mine coal. It is mostly laid down on the surface of the old plane and is covered by a galvanized-iron hood in short sections, secured on one side by galvanized bolts and on the other by hinges. Each section can be lifted on the removal of the bolts, enabling the idlers to be lubricated by Alemite pressure-greasing fittings, one of which is provided for each idler. This lubrication need be renewed only once in three to six months. The belt is actuated by a Texrope drive and controlled by a General Electric solenoid brake. Any excess power goes into the line.

Arriving at the tipple, the coal is discharged by the belt onto a primary screen, 6 ft. wide and 38 ft. long, 12 ft. of the upper part of the screen being devoted to the removal of nut and slack, and 8 ft. of the lower end to the separation of egg-size coal. Lump and egg coal from the primary screen go direct to their respective picking tables, which discharge them, after hand-picking, over shaker rescreen loaders onto apron-type loading booms. However, they may go to their respective river apron-type picking tables, from which they are discharged separately onto 36- and 30-in. river belts.

A secondary screen, 5 ft. wide and 28 ft. long with 20 ft. of screen area, separates stove, nut and slack. The stove and nut can go from these to stove and nut picking tables, and thence to the belt-type railroad loading booms. These also have a rescreen which loads undersize on the scraper conveyor for remixing with slack. Thus, four sizes may be picked, rescreened and separately loaded on four separate railroad tracks, and in addition a chute delivers slack to a fifth track. Combinations of sizes also can be loaded on these tracks.

The two loading booms on the river tipple are of the apron type and are raised and lowered by Jeffrey hoists. The railroad loading booms are lifted and depressed to the railroad cars by Pawling & Harnischfeger hoists. Two Brown-Fayro and three Fairmont car retarders place cars on the five railroad tracks, and for maneuvering river barges up and down stream under booms a Mead-Morrison electrically operated four-drum hoist is provided.

One unusual feature is the means of regulating the speed at which the belts run which deliver coal to the river tipple. Each is operated by a Reeves variable-speed transmission. The motor shaft has on it a pulley with two wedged disks, one on each face of the pulley, and these wedges can be made by a lever to approach or recede from each other. Thus, a belt of given width will rest on these wedges, as they revolve at different distances, dependent on whether the wedges are close together or far apart, provided the belt is stiffened across its face while flexible along its length. When the wedges are close together, the effective pulley diameter

Fig. 1—Five-Truck Rail-and-River Tipple and Cleaning Plant, Naomi Mine.

will be large, and when they are further apart, that diameter will be small.

To make the belt stiff in the direction desired, wood slats, or cleats, are placed across it on each face of the belt at such short distances from each other as will not destroy the flexibility of the belt longitudinally, and these cleats are bolted securely. They will be seen in Fig. 2 (a). The ends of the slats are faced with leather, and it is these leather tips, and not the belt itself or the slats, which come in contact with the wedged disks on the pulleys. Thus, the diameter ratios of the pulleys are made to vary and, with a constant speed of motor drive, the pulley actuating the belt is made to move at the desired speed. The quantity of coal to be delivered varies, and consequently it is well to have the speed of operation variable, for degradation is thus prevented.

Shaker boom loaders deliver coal from the two belts to the river booms, and these shakers also are operated by Reeves transmissions. Incidentally, these belts are hooded where exposed, like the long belt from headhouse to tipple. That belt runs at constant speed.

By the use of rescreens in front of all picking tables, a product void of all degradation particles is obtained, and this has been found helpful in marketing the coal. Recently a washing plant has been added to clean all coal between 4-in. and 1-in. However, the preparation plant is so arranged that coal may or may not be passed through the washer, according to market demands. A scraper-type conveyor takes the 4x1-in. coal from the primary screen to a 75-ton storage bin, whence it is removed by an apron-type conveyor which discharges into a three-compartment Jeffrey air-operated jig. An illustration of this jig appeared in the July issue of *Coal Age*, p. 295.

A General Electric centrifugal blower delivers the air to a receiver extending along the top of the jig. This compressed air is admitted by six valves, two for each compartment, which presses down on the water, lifting it in a tank, or "hutch," with a semicircular bottom against the underside of three plate screens of variable inclination. Valves admit or release the air so as to cause a pulsation, causing the water to rise and fall respectively, thus making the coal which rests on the screen plates of the three compartments into which it is fed to rise and fall in unison. The heavier and dirty coal and refuse fall to the bottom of the bed and rest on the screen plate, with the refuse as the lowermost stratum. A float, which can be adjusted for any depth of refuse suited to that compartment, floats on the refuse bed and regulates the speed at which a star release, or "refuse draw," permits the refuse to escape, thus keeping a bed of refuse on the screen of depth suited to the particular kind of coal being washed and

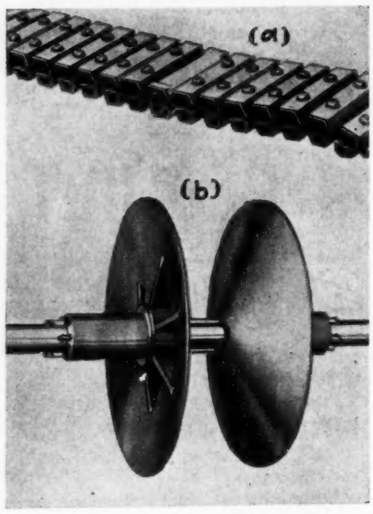


Fig. 2—(a) Belt, Laterally Stiffened; (b) Pulley Made of Two Coned Disks on Which Belt Runs.

preventing any good coal from being drawn off with the refuse.

This bed thickness, or rather the adjustment of the float, is a matter for test and experience with any kind and quality of coal feed. The coal enters at one end of the compartment and passes to the next and on to the third, being stratified in each by the action of the water, and finally passing over a weir. The first compartment removes the heavier refuse and succeeding compartments less and less heavy refuse until all is removed. Refuse from each compartment of the washer falls to the bottom of the semicircular tank through three rectangular chambers, or wells, one for each compartment, and on reaching the bottom is lifted by a draining bucket elevator and dropped onto a 24-in. drag-type refuse conveyor, which, in turn, discharges onto the refuse conveyor of the rail tipple, which carries hand-picked material from the railroad tipple to a refuse bin adjacent to the two-compartment domestic coal bin in the immediate vicinity of the slack track. Here is a convenient automobile road on which a Ford truck can be operated and refuse taken about 200 ft. to the refuse dump.

Streamlining prevents the float in the jig by which the refuse draw is operated from interfering measurably with the flow of coal being washed. A screw with force-feed lubrication withdraws fine material, which falls through the screen plate in each compartment to the bottom of the hutch and delivers it to each of the three bucket elevators. By air control, automatic refuse control

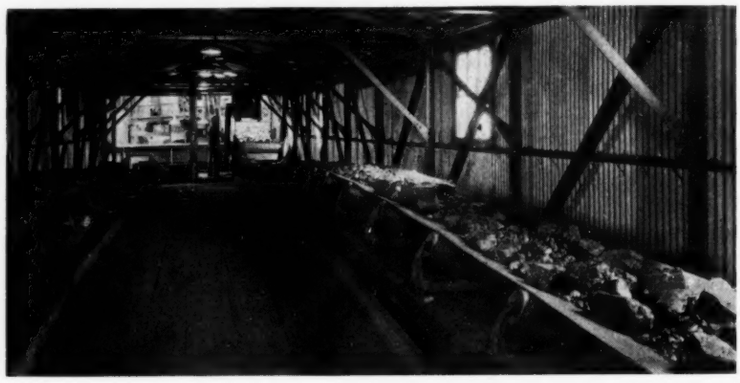


Fig. 3—Belt Conveyors From Rail Tipple to Barge Loading Booms.

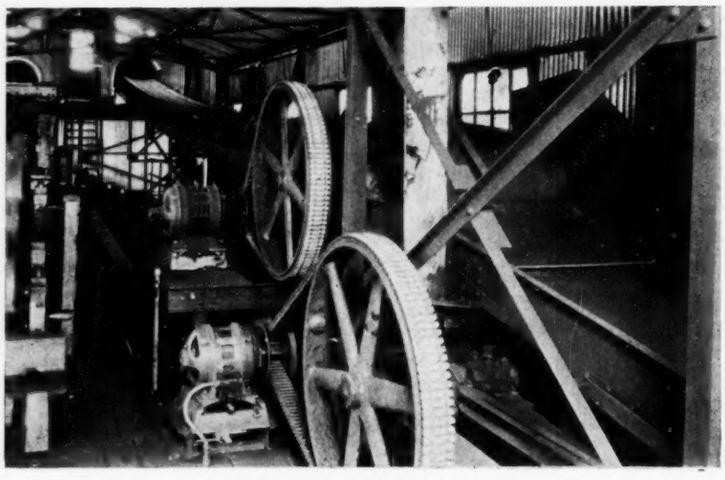


Fig. 4—Speed Regulation of Belts Delivering Coal to River Tipple.

and adjustment of screen-plate inclinations, conditions are obtained favorable to exact stratification by gravities and consequently exactitude in cleaning.

Because of the extremely irregular operation and the short time the plant has been in service, details as to analysis of the washed coal and as to coal in refuse would not be of sufficiently long duration to attest the value of the process, but a noticeable improvement in the coal is quite apparent.

Coal from the three-compartment unit comprising 150 tons per hour goes to dewatering screens, and thence to a scraper-type conveyor, which discharges onto the secondary screens in the railroad tipple, where the coal is sized, and degradation products larger than those trapped on the dewatering screens are removed. It flows thence as already described. Sludge from the dewatering process, small in quantity and solely from degradation, is removed from the sludge tank, in which it has collected, by a drag-type conveyor, with crossbars about 18 ft. long, which move slowly over the bottom of the tank. This sludge is deposited on a small belt conveyor 16 in. wide, which drops it onto the slack conveyor in the railroad tipple. It must be remembered that no coal goes to the jigs of less than 1-in. diameter. Consequently, there is such a little sludge as not to raise perceptibly the percentage of water in the slack with which it is mixed.

Alemite fittings are used on the run-of-mine belt, as stated, and on the two river belts. Bosch automatic grease lubrication is used for the jig. All other lubrication is by compression-type grease cups. Byers wrought-iron galvanized sheets are placed on the bottom of the river-belt conveyor gallery between it and the tracks of the Pittsburgh & Lake Erie R.R. to protect the structure against the corrosive gases from the stacks of the railroad locomotives. The entire improvement, including both tipples, the washery and the belt from the headhouse, was designed and constructed by the Jeffrey Manufacturing Co., with the exception of the foundations for these buildings and the piling in the river.

At present, river water is being used for washing. A connection with the local water supply is being constructed. When it is finished, a filtered water supply will be afforded which will be available also for fire protection. To reduce the dust, the coal as it is discharged from the run-of-mine belt at the foot of the hill is dampened by three high-pressure sprays. It is a high-volatile coal, and the dust from it is highly explosive and might be ignited if it reached the needed concentration. Three such sprays also are used on the end of the dewatering screens in the washer to remove fine coal and keep the coal lustrous. For the most part, Texropes are used for the transmission of power from motors to operating units, the full connected load of all motors being 300 hp. There are, however, some chain drives and the Reeves drives already described. Power comes to the plant as 2,200-volt, 60-cycle, alternating current from the lines of the West Penn Power Co. and is stepped down on the power company's transformers to 440 volts.

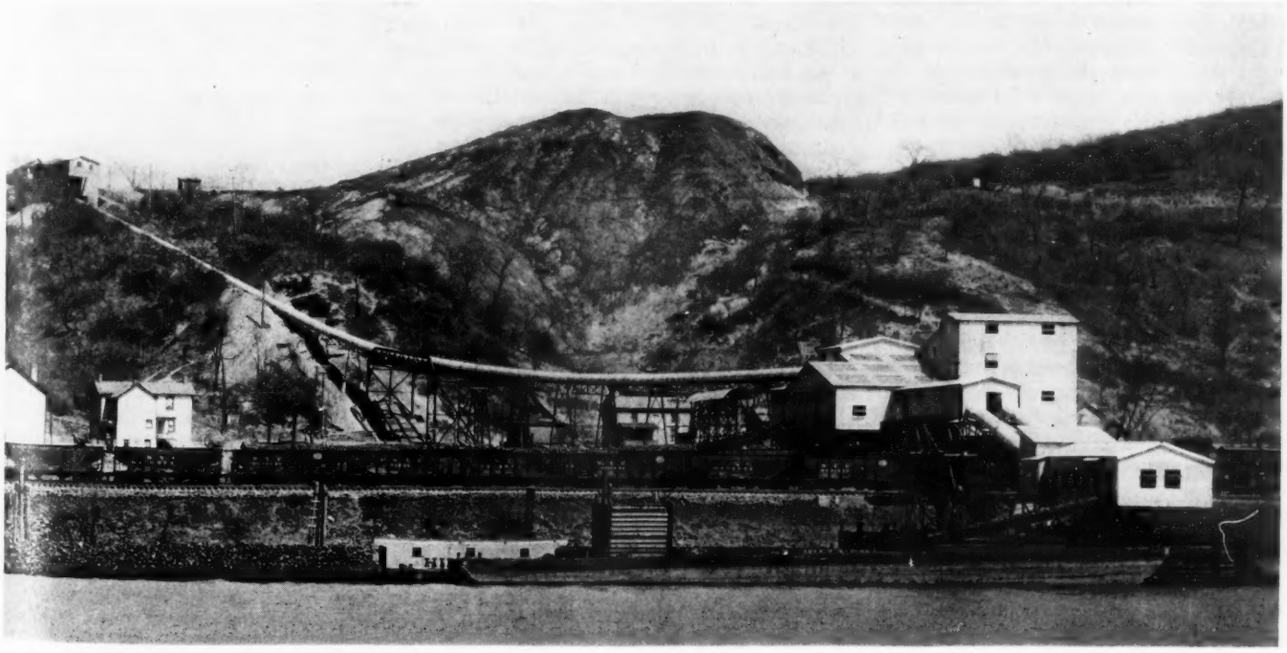
The entire system is interlocked so that no unit can pass coal onto equipment operated by another motor unless that equipment is running and can take care of it.

All electrical control equipment is mounted in four groups consisting of dust-tight steel cabinets, each containing Westinghouse De-Ion circuit breakers, magnetic starters, pushbutton control switches and selector switches required for all motors located at the respective locations. One group located in the rail tipple between the lump and egg picking tables controls twenty motors used in or adjacent to the rail tipple. One group located in the river tipple controls six motors used at this point. A third group, located in the cleaning plant, controls the nine motors used in that plant. A fourth group is located in the headhouse for controlling the feeder and run-of-mine belt.

All drives are interlocked in a continuous sequence corresponding to the flow of coal. Any unit can be cut out of sequence by means of selector switches used in conjunction with each "start" button. All control groups were completely assembled, wired and tested at the factory, ready for connecting the motor feed lines. The cabinets were built and wired by the Penn Electrical Co. The use of these cabinets has enabled the control to be put in greatly reduced space and has eliminated many of the failures to which an exposed panel would be subject. A De Laval low-head, high-capacity, screw-propeller pump supplies water for the jig.

Both tipple and washer are of all-steel construction, including the trestle on which the run-of-mine belt makes its approach to the tipple. The only exceptions are the wood floors. Corrugated steel is used for roof and walls. All window frames are of steel, and the large skylights are of wire-mesh glass. Unit heaters and steam coils will be provided in the washer and steam coils in the tipple and at loading points.

Fig. 5—Showing Belt-Conveyor Housing From Head House to Rail Tipple.



CODE-CONTROL PLAN

+ Still Widely Favored by Operators

Who Score Weaknesses in Enforcement

HOW DOES the bituminous coal-mining industry regard its NRA code of fair competition after working under its provisions for one year? Despite the disappointments and disillusionments which have been crowded into the twelve months since the code went into effect on Oct. 2, 1933, majority sentiment among coal-company executives with mines east of the Mississippi River still indorses the code as a distinct benefit to the industry and wishes to see the code-control idea continued in some form after the expiration of NIRA. Enthusiasm is less general, however, in the Rocky Mountain States and majority opinion in the Southwest is hostile to extending code control beyond its present statutory limitations.

But even in those sections of the country where sentiment largely favors the code plan, criticism of actual enforcement—or lack of enforcement—is widespread. This criticism is directed not only against NRA officials and other governmental agencies upon which final responsibility for securing compliance from the recalcitrants devolves, but also is turned against the code authorities set up by the industry itself. Coal men who do not sit in code administration councils are not the only ones who find fault with existing weaknesses in enforcement; some operators who are members of divisional and subdivisional code authorities are equally critical in reviewing the shortcomings of code administration. No small part of the responsibility for the failure to secure more effective compliance, in the opinion of one spokesman for this latter group, can be traced to neglect upon the part of code authorities in setting up the necessary machinery and to their "unwillingness to 'turn in' the chiselers."

Code Support Undermined

Although most of the code violations are ascribed to small wagon mines, failure to take punitive action against them has been undermining the support the code has received from operators in general sympathy with the control program. These continued infractions and the constant nibbling away at the markets of producers who have been obeying the code, declares an executive close to code administration work in the Rocky Mountain States, has resulted in a condition where certain of the larger operators are either openly violating the price and fair-trade-practice provisions of the code or contemplating such action. If this movement spreads, destruction of the labor provisions eventually will follow.

"Only the prompt action of NRA officials charged with code enforcement and the litigation of enforcement problems under the code can successfully save the situation. Actions against violators of the code must be promptly brought in the courts and carried to a successful termination if the code is to be saved. The threat of possible litigation is no longer effective."

Stabilization Stressed

In assaying the benefits of the code, price and wage stabilization loom large. The general consensus of opinion is that one cannot survive without the other. Because there have been so many changes in NRA policy on price-fixing, however, fear is expressed by some operators that the price protection now afforded by the code may be withdrawn at any time by administrative order. Such a withdrawal, it is contended, would encourage a return to the chaotic conditions which prevailed in many producing fields prior to the organization of district sales agencies and the establishment of NRA. For these reasons, while the actual price structures and price-fixing methods now in effect do not meet with universal approbation, most producers are firmly convinced that some form of continuing price regulation and correlation is necessary to prevent a revival of cutthroat competition that robs both capital and labor of their just rewards.

These general conclusions are based upon a recent survey in which the editors of *Coal Age* sought a representative cross-section of the thinking of executives in the bituminous-mining industry on the effects of NRA on the year's operation and whether some form of code control should be invoked after NIRA had expired by statutory limitation next June. These executives from all the major producing fields throughout the country were asked:

(1) Where has the bituminous code helped—and why?

(2) Where has the code hurt—and why?

(3) What are the strong points of the code?

(4) Wherein do its weaknesses lie?

(5) How has the code been administered and enforced?

(6) What have been its effects on coal-company profits or earnings?

(7) How has the code affected the actual earnings of labor?

(8) Has it added more men to the payroll?

(9) Would you like to see the code idea continued after the expiration of NIRA and, if so, in what form?

West Less Enthusiastic

As indicated in the opening paragraph, the responses showed the greatest support for the code in the producing States east of the Mississippi River. In the Southwest, the imposition of the seven-hour day by the "emergency" order of March 31, 1934, and the simultaneous attempt to jump the basic day rate for skilled inside labor from a minimum of $3.75 for eight hours to $4.60 for seven hours still rankles despite the later NRA compromise orders on $4 and $4.35. The failure of the code to provide for any flexibility of hours which would permit the mines depending upon seasonal domestic demands to absorb the bulk of their output to work in excess of 35 hours for limited periods of the year also continues to be a sore point.

This inflexibility also is resented in

North Dakota and in the Rocky Mountain States where domestic tonnage is a major factor in demand. In addition, many operators west of the Mississippi River feel that the formulation and the administration of the code have been largely dominated by the viewpoint of the producers east of the river and that too little consideration has been given to the conditions prevailing in the Southwest and in the Rocky Mountain area. On top of this, mild weather in those sections last winter curtailed the volume of business which operators there might otherwise have enjoyed. Producers in the Rocky Mountain region admit, however, that if it had not been for the price-fixing provisions of the code, the mild winter probably would have induced an orgy of ruinous price slashing.

Western Kentucky operators, who accepted the seven-hour day, but applied to the courts for an injunction against that part of the NRA order which increased the basic minimum rate for inside skilled labor from $4 to $4.60 and are now operating at the $4 rate under protection of an injunction issued by U. S. District Judge Dawson, view the situation with mixed feelings. Although there are some producers in this field—and in every other district—who hold that the whole NRA movement is a perversion of legitimate governmental functions and should be abolished, other western Kentucky executives, generally speaking, are not unwilling to concede that there was much that was good in the fundamental conception of the NRA program. Operators in this group feel that price stabilization and the elimination of unfair trade practices are advantageous to the industry, but are critical of the administration of the code.

How Code Helps Industry

Although the list of specific benefits gained under code operation is a long one, with the exception of the advantages flowing from the elimination of unfair trade practices, each item on that list is a variation of the major theme of stabilized prices and wages. The code, says one executive, has resulted in better coordination of wages between different districts. It has removed the large producer who formerly slashed wages to extend his competitive markets from the picture, reports another. There is less labor trouble, adds a third, who heads a company that has had its full share of grief from strikes in years gone by. Producers have been brought into closer contact, with a resultant strengthening of the spirit of cooperation and a lessening of jealousy and suspicion.

Price stability has aided more orderly marketing and has decreased the buyer's resistance to fair prices, because he has learned that the old game of shopping around until he finds some hard-pressed mine willing to cut prices to move tonnage is no longer successful. No stronger illustration of this can be found than the manner in which prices on slack coal have been maintained throughout the dull summer season of 1934; with surplus screenings piling up on mine sidings throughout the eastern part of the country, operators have withstood the pressure to break the code price-structure. Following the old system of making any price—no matter how ridiculously low it might be—to move the tonnage would mean a sacrifice of income and an inevitable wrecking of the present wage structure.

Price Fixing Under Fire

This same price stability so highly praised by the majority of the operators, however, is the target for the minority that holds that the imperfections and injustices in code provisions and administration outweigh any advantages. Many of these dissenters represent the smaller mines and the mines producing medium or inferior grades of coal. In the past, they contend, their place in the market has been maintained through lower prices, and this condition has not been recognized in the differentials established by the price schedules promulgated by the code authorities. With fixed prices, these producers have discovered that their outlets through wholesale and jobbing channels have been narrowed. Price levels in some districts, it is asserted, have been set so high that owners of captive mines find it more economical to increase their own capacity than to buy part of their requirements from the smaller commercial operations.

But, retort many of the producers who have no criticism to make of differential price adjustments, life for the operator—large or small—who endeavors to adhere strictly to all provisions of the code is no bed of roses. Chiseling, they assert, is rampant and enforcement reaches forth to catch the offenders with palsied hands. Held to strict accountability because of their size, larger producers declare that they are penalized both by sharp practices indulged in by some of their commercial brethren and by the competition of the wagon and truck mines to which the code is only a figure of speech. Here they stand on common ground with the smaller commercial operators who are equally caustic in their condemnation of the competitive practices of the thousands of wagon and truck mines that have been born or reborn since the commercial mines accepted the straitjacket of rigid wage and price control.

Complaint is voiced by some operators in the South and in the Southwest that there is too much labor domination. Many producers still feel that the seven-hour day should not have been imposed. Coupled with the increases in basic rates of pay which became effective at the same time, the resultant higher costs of production weaken the position of coal in competition with oil, natural gas and hydro-electric power. The competitive situation did not permit these producers to advance their prices enough to absorb all of the increase in production costs. But, even with the operator absorbing part of the higher costs in reduced earnings or increased losses, tonnage has suffered. Alabama, in the opinion of one operator in close touch with the situation, stands to lose as much as 25 per cent of its business in small steam coal to natural-gas and hydro-electric competition. Large-scale equalization of wages, argue critics of the labor policies of NRA, has had a tendency to ignore the necessities of individual producing fields.

The burden of code assessments gives rise to an occasional complaint. Code specifications on slack sizes are attacked by some of the smaller operators in Pennsylvania and the Southwest on the ground that the sizes specified are not made by the objecting mines and that, as a result, business is thrown into the hands of their larger competitors. Complaint also is made in some cases that the volume of reports required from the smaller producers is burdensome to them and unnecessary for proper code administration. Some operators not so small oppose filing certain data with code authorities because they are out of sympathy with the administration setup.

"Self-Government" Questioned

This opposition also finds voice in the criticism a number of operators make of code administration. Although NRA at the time of its inauguration was hailed as a glorious experiment in industrial self-government, there is a disposition in some coal circles to question sharply the desirability of the degree of self-government embodied in the codes. In addition to the minority of the smaller operators who claim that code authority membership is too largely centralized in the larger producers and that centralization gives such producers the opportunity to use their foreknowledge of code authority decisions to the disadvantage of the operators not sitting in the code administration councils, some of the code authority members themselves feel that their position is anomalous and at times embarrassing.

"The fundamental theory of self-government in business," says one code authority member who takes this view, "is unsound. It is like having a jury made up of the friends and relatives of the accused, together with others who have personal grudges against the accused. We are expected, when we sit in the code authority, to act as individuals for the good of the industry, to divest ourselves of personal interest. The man who is responsible to his board of di-

rectors and his stockholders is asked to sit in judgment and deliberate on questions which often might be good for the industry as a whole, but suicidal to the interests that he represents. This places him in an embarrassing position as to where his duty lies."

Another criticism made of code administration is based on the failure of the original code setup to make any definite provision for correlating prices. Independent action by divisional and subdivisional code authorities in fixing prices led to reprisals by code authorities in competing districts and reacted unfavorably on buyer confidence in the stability of code regulations. As a number of executives have noted, cutthroat competition between individual producers within a district was being replaced by dangerous inter-district competition. Development of this magnified competition, temporarily at least, has been checked by the action of NRA in establishing a joint marketing committee and in requiring interchange of price schedules between affected districts in advance of any official approval of the prices promulgated.

Price Control an Issue

Although majority sentiment is overwhelmingly in favor of the continuance of some form of price control, many thoughtful operators question whether the present form is the best that can be worked out. The inflexibility and the complexity of the average schedule causes concern. Some believe that unless simplification can be introduced, the present system will break down. There are others who condemn the established levels both on the ground of rigidity and on the ground that they are so high that they hold an umbrella over the inefficient and high-cost mine while preventing the efficient, low-cost mine taking proper advantage of its more favorable situation.

Some operators favor the establishment of basic minimum prices for each district. Presumably these minima would not be high enough to cover costs at all mines, but would represent average costs or, possibly, lowest costs. Such a system would place the burden of securing realizations above these minima on the salesmanship of the high-cost mines. Others modify this suggestion by advocating the adoption of both minimum and maximum prices—the former to protect the producer from destructive price competition when demand was low; the maximum to protect the buyer when output was close to immediate demand. This plan was specifically urged as a necessary corollary of production-control allocation schemes on the theory that the buyer should not be penalized if the supervising agency underestimated potential demand and that the producer should not suffer if the allocation was based upon overestimates.

Others who would abandon the present price-fixing system but still seek to protect the industry against destructive price competition advocate a simple prohibition against selling coal at less than the cost of production. Theoretically, of course, adoption of this provision would eliminate the objections raised against the methods now employed by the code authorities. Such a prohibition rigidly enforced would be a boon to the low-cost efficiently managed mines, but the practical difficulties involved in policing and administration would be tremendous, since enforcement might mean the examination of literally thousands of cost sheets to determine whether specific prices violated the prohibition.

All of these suggestions make cost of production the controlling factor in establishing the base-line, or minimum price. Any recognition of superior quality would have to come in the form of a premium over the base-line figure. This setup, of course, would give the producer of the better grades who was willing to sacrifice premiums for volume a distinct edge over the producer with coal of inferior quality but costing as much or more to mine as the better grade. Adoption of this plan of making production cost the controlling factor might be expected to aggravate the complaints of operators with medium or inferior coals who now protest that existing differentials between code prices on high- and low-grade coal are too thin for the survival of the mine handicapped with the inferior coal.

Must Consider Competition

Many producers, deeply conscious of the threat to the industry in the increasing use of substitute fuels and hydroelectric power, are disturbed lest code authorities attempt to advance prices beyond economic levels or that the demands of labor for shorter hours and higher pay force the code authorities to take such action. In the opinion of some producers, the present code prices are near the border line. There are some, too, who urge that in any revision of existing price structures or the adoption of any new plan for price control more consideration be given to the domestic consumer. This meal ticket for many mines, it is true, has received more consideration since the establishment of the code because code control made it possible to increase in some measure the sadly depressed quotations on industrial fuel. Finally, whatever system may be worked out, it is generally agreed that there should be definite enforcement powers lodged with the control agency; indeed, at least one operator would license mines and revoke this license to do business upon proof of code violation.

Quantitative evaluation of the effect of the code upon the earnings of the industry cannot be made with any substantial degree of accuracy in the absence of more detailed comparative figures on the industry as a whole than are now available. Certain trends, of course, can be deduced from the cost and realization data compiled by NRA, but these figures give no comparisons with previous years. It is obvious, however, that where tonnage has not been reduced, earnings under the code have been increased—not always to the point of actual profit but to the point where a material reduction in deficits has been effected. One Southern field, for example, while still below the profit line, reports its income the best in three years. "We are showing a slight profit after ten years of steadily declining cash surplus," states another operator. "Before the code," says a third, "we were on the rocks and ready for the sheriff." This trend toward recovery is revealed in many other comments made in the course of the present survey. Where wage advances could not be completely absorbed by increased prices, of course, there is evidence of a reverse trend; these cases, however, seem to be in the minority.

How Labor Benefits

Generalizations on the effect of the code upon the income of the mine workers are impossible. Due both to the seven-hour day and advances in basic rates, hourly rates have been increased throughout the greater part of the industry. Where production has been maintained, the worker, of course, also has had his actual earnings increased. Employment likewise has increased as a result of the seven-hour day. Conditions vary so much as between individual mines and as between different districts that it would be difficult to establish an average percentage increase in employment due solely to the shorter work-day and eliminating any gains attributable to increased demand. Reports from individual companies with tonnage fairly constant show increases from 5 to 30 per cent in the average number of workers employed.

In discussing the future, some operators opposed to the continuance of the present NRA system would be willing to compromise on the preservation of the fixing of maximum hours and minimum wages. There is demand, too, for the elimination or clarification of Sec. 7 (a) of NIRA which would definitely cover the bargaining rights of minority groups. Other suggestions for future control include the establishment of a separate unit in NRA, the establishment of an agency that would have powers over coal comparable to those exercised over railroads by the Interstate Commerce Commission, and the creation of a Coal Exchange with authority to prorate production. The idea that allocation should be part of any continuing scheme of regulation is shared by several operators.

KEHOE-BERGE BREAKER

+ Receiving Blended Feed

Loads 2,500 Tons Daily on Single Track

By A. B. SHUTTS
General Superintendent
Kehoe-Berge Coal Co.
Pittston, Pa.

BREAKERS are custom-built and not mass-production units and are constructed to suit the special requirements of the times, definite local needs and environing conditions, as is well illustrated by the breaker completed July 1 of this year for the Kehoe-Berge Coal Co., Pittston, Pa. This breaker is located at Duryea, Luzerne County, Pennsylvania. Geographically, it is on the north bank of the Lackawanna River and geologically in the northern half of the Northern Anthracite Coal Field.

Like many breakers today, it receives coal from many sources, brought to it in many ways and subjects it to a common cleaning process. Many anthracite mines are of waning production and many are so confronted with problems of development that it is difficult to obtain from them the large production that is desired; consequently, to provide a breaker with 2,500 tons capacity for eight hours of operation, such as the Kehoe-Berge breaker will readily handle, several mines must be provided.

This breaker draws from William A Colliery, No. 10 Tunnel, Broadwell Mine, No. 20 Drift, Kresge Drift, No. 20 Slope, Fowler's Drift, Marcy Drift and Babylon Mine. All this coal comes by railroad in hopper cars. But some comes by truck from neighboring mines, some of which are owned by the Kehoe-Berge company and some privately owned. But all the latter coal is bought by the company and is treated with, and as a part of, the rest of the coal. To add to the variety, coal from William A will soon arrive in mine cars. None of the coal, however, as at many breakers in the anthracite region, comes from either strippings or waste banks.

With all the uncertainties of anthracite operation, of which there are more than perhaps in any other class of coal mining, it is well to have more than one source of coal so as to assure continuity of supply and to give opportunity for development. All the eight major coal sources just mentioned are mines which have, at some time, long been in operation and are leased from the Lehigh Valley Coal Co.

The circumstances just cited indicate the necessity for a storage yard of considerable size to receive the railroad cars coming from the various mine openings and to hold these for orderly dumping to the breaker, so that this operation may proceed without interruption or too frequent need of switching service. Two tracks, each holding about sixteen cars, are therefore provided for the mine-run material, and one of these is equipped with a Fairbanks track scale to check the weights of incoming loads when required. These tracks are each furnished with dump hoppers and mechanical feeders to afford control of the quantity of material taken from each hopper at any time. A third track is provided for empty cars, these being needed only when the number or character of loaded cars received is insufficient to supply suitable empties for loading. However, at this breaker, though almost 20 per cent by weight of the mine-run material is removed by washing, a car of coal is loaded, as a rule, for every car of mine-run dumped.

Storage Yard Facilitates Sorting

As a counterpart to this, a seven-track storage yard of about 125-car capacity is provided on the lower side of the breaker to facilitate the sorting, storage and shipment of cars loaded for market. Both yards, and also the loading track connecting them, have been given gradients ranging from 1¼ to 2 per cent, which are ample for gravity operation, so that the complete track installation is exceptional in its capacity and operating facilities.

Though primarily intended for accommodation of cars, the track layout just described and the dumping and feeding facilities installed at the foot of the main intake conveyor to the breaker afford means of controlling the feed to a degree unusual in the anthracite region. Because of the track-storage capacity and the equipment to regulate the rate of discharge from each of the three contributory supply hoppers, two under the standard-gage trucks, as just mentioned, and one for receiving material from mine cars and automobile trucks, a relatively uniform and blended feed can be delivered to the intake conveyor. This ability to blend the coal as it is received from the various sources previously mentioned was one of the prime objectives envisaged by the management as a means of insuring uniformity in its market coal.

For railroad-car loading, a single track is provided on which cars receive coal from the eight 75-ton overhead storage pockets that extend a distance of 72 ft. lengthwise of this track. Two Fairbanks track scales, each 50 ft. long, are located immediately above and below the breaker to weigh empty cars as they arrive and loaded cars as they pass out from under the pockets. Ordinarily, the loading out of as much as 2,500 tons in eight hours on one track in a space of 72 ft. would not be practicable. To permit of this, two cars are loaded concurrently on the same track. One car receives egg, stove, nut or pea, and is filled by a boom loader consisting of a flat belt, 42 in. wide, with skirt boards. This brings the coal from one of the several pockets and deposits it in the railroad car with minimum breakage yet in requisite capacity. The other car is loaded with one of the steam sizes—buckwheat, rice, barley or buckwheat No. 4—direct from the pockets.

These cars are spotted along this load-

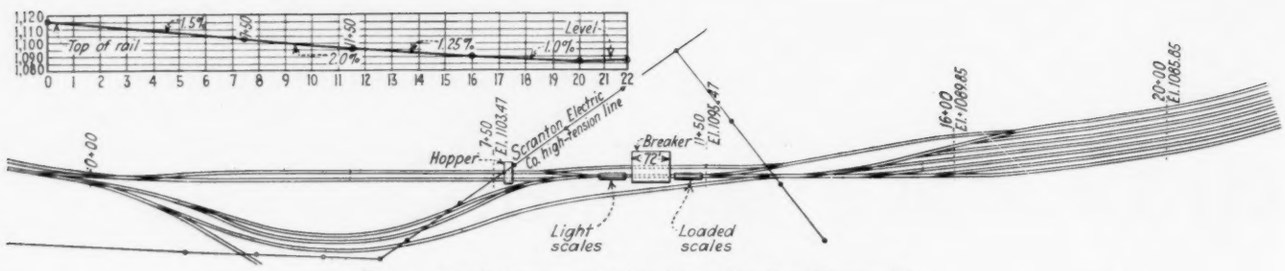


Fig. 1—Track System at Kehoe-Berge Breaker, Duryea, Pa.

ing track by means of two Webster car retarders controlled by the attendant by whom the cars are loaded. The loading operation is facilitated also by signal lights which are located at the car loader's station. These permit the screen attendant in the breaker to note the quantity of coal currently in storage in each pocket and indicate the status to the car loader. Each pocket for the storage of prepared sizes is equipped with two discharge outlets and lip screens to insure the removal of degradation products, and thus the contents of the pockets can be discharged rapidly, yet without carrying undersize with the coal. Speed in the withdrawal of coal from the pockets and not belt or railroad-car capacity usually is the factor that ultimately determines the speed with which cars can be loaded, and withdrawal cannot be satisfactorily speeded unless there is adequate screening facility to assure that all undersize will be removed. Hence, as stated, two discharge outlets and two screens have been provided for each prepared-size pocket.

Property limitations at the location of this breaker, together with the need for providing storage yards of maximum capacity both above and below the breaker, made it necessary to restrict, to the greatest possible extent, the length of trackage passing under the breaker and used for loading, because whatever length of track is saved at this point is added to each of the seven storage tracks below the breaker. In this instance it has been possible to weigh and load the cars in a length of approximately 200 ft. between the ladder tracks leading to the respective storage yards. At the same time it has been possible to provide an additional track beneath the structure for handling supplies and materials, this track traversing the roadway provided for the loading of trucks.

As said, the coal brought by railroad arrives by two tracks; each of these has a receiving bin below it with a push feeder driven by a multiple-speed motor through a speed reducer. Hence, the percentage of coal admitted from any one source can be regulated so as to make the mix of reasonable regularity. This mitigates the problems arising from variable feed and tends to assure the operator that his product will be of uniform quality. A bin also receives the incoming mine-car and truck coal, and this bin is fitted with similar feeding devices, so that its percentage contribution can be closely regulated. The raw coal is thus assembled on a shaking conveyor which in turn deposits it on the main flight conveyor, which is 3 ft. wide and has a pitch of 5 in. to the foot. By using this means of elevating the coal to the top of the breaker, the pitch could be safely increased above that permissible with a belt and the distance between dumping point and breaker correspondingly shortened, as also the length of the conveyor at the end where it receives its load. Moreover, as some of the coal has to be washed from the cars, a belt did not seem as suitable as a flight conveyor.

Breaking Coal to Egg and Under

The main flight conveyor discharges onto a platform shaker, having a pitch of 1 in 12, which will be termed the No. 1 shaker. This has two screens, the oversize on the upper screen being lump-and-steamboat and that on the lower screen being broken-and-egg. Below the screens is a blind plate which receives all smaller sizes. Oversize from the upper screen (lump-and-steamboat) goes over the picking table, which is reciprocated by the screen, and this oversize goes thence to the No. 1 rolls, where the coal is reduced in one operation to broken-and-smaller. The product of these rolls goes to No. 2 shaker, where it joins the broken-and-egg from the top of the second screen of the platform, or No. 1, shaker. Here the egg is removed, and the broken goes to No. 2 rolls, where it is reduced to egg-and-smaller. This product in turn joins similar coal from No. 2 shaker and goes to a screen where egg is separated from smaller coal. At the end of No. 2 shaker are located No. 3 rolls, where all or any part of the egg coal may be reduced to stove-and-smaller. Beyond these rolls, undersize from No. 3 shaker joins coal from No. 3 rolls (if egg is being crushed) and also coal from the blind plate in the platform, or No. 1, shaker, thus reassembling the entire product received by the breaker, now reduced either to egg-and-smaller or to stove-and-smaller.

This coal passes to a four-deck shaker on which it is separated into four sizes: (1) egg-and-stove, (2) nut-and-pea, (3) buckwheat-and-rice, (4) barley-and-No. 4 buckwheat. Egg, stove, nut and pea go for cleaning to a Chance cone of 15-ft. diameter, and buckwheat, rice, barley and No. 4 buckwheat to one of 10-ft. diameter. This 10-ft. cone has a square top.

Overflow from the 15-ft. cone is discharged to four decks of shaking screens, 6 ft. and 8 ft. wide by 27 ft. long, suspended at a pitch of $\frac{1}{2}$ in. per foot by means of springboards that are set back at an angle of 15 deg. from the screen surface. These screens remove the sand and water that overflow with the coal and divide it into four sizes—egg, stove, nut and pea—one size to each screen deck, so that the coal by the time it reaches the discharge ends of these screens, having been both duly cleaned and sized, passes directly to the respective pockets.

Similarly, the overflow from the 10-ft. square-top cone is discharged to four decks of screens, 8 ft. wide by 27 ft. long, which remove the sand and water from the overflow and divide this stream of coal into sizes—buckwheat, rice, barley and buckwheat No. 4. At the front end of the bottom deck of the prepared-coal screens to which reference has just been made, undersize is removed by three screen jackets and is returned to the breaker feed.

Two banks of screen decks each 8 ft. in width were used in preference to a greater number of screen decks of less width, because a screen 8 ft. wide has been found to have a somewhat greater capacity and efficiency than two screens each 4 ft. wide. This is explained by the fact that, in attempting to deliver a stream of coal to two sets of screens, it is difficult to divide the streams so that each screen has an equal duty at all times. With two screens, one not infrequently is overloaded while the other is correspondingly underloaded. This inequality of division is entirely removed when all the material is delivered to a single wide screen, its reciprocation immediately assuring a uniform distribution over the full width.

Sand and water from and beneath the prepared-size and steam-size screens go to a conical settling tank, where the solids settle and are pumped back into the tops of the two Chance cones. Refuse is removed from these cones by gates actuated by compressed air from an Ingersoll-Rand compressor, the operation of which air is electrically controlled by the attendant who handles

both cones from his station above them. The refuse from the large cone, which ranges from egg to pea size, mixed with sand and water, is delivered to the rear of the top deck of a refuse shaker, which latter passes the nut-and-pea size and sand, retaining on the upper surface egg-and-stove size. This latter product may be passed to a pair of rolls to reduce it to nut-and-smaller. These sizes can then be returned to the main flight conveyor and thus be made to pass a second time through the breaker for the recovery of fuel values which, being, during the first washing, combined with heavy-gravity material in the larger pieces of coal, could not be recovered without further crushing.

The nut-and-smaller refuse falls from the upper deck of the refuse shaker onto the lower deck, which has $\frac{3}{32}$-in. and $\frac{3}{64}$-in. openings for the removal of sand and water. Here it is met by the finer refuse from the 10-ft. cone and in combination with this is discharged to a flight conveyor which elevates it to the top of the refuse bank. When the rolls, to which reference has just been made, are not operated, the larger-size refuse also is discharged to this same flight conveyor and thence to the bank. Sand and water discharged with the refuse from the two cones is collected in a 12-ft.-diameter settling sump from which a 4-in. pump withdraws the accumulated sand and returns it to the larger conical tank, already described as receiving the underflow of sand and water from the screens which size the coal from the two Chance cones.

Whether it will be profitable to crush the egg-and-stove size of refuse to recover its values is not definitely determined. From float-and-sink tests of material picked by hand from this refuse, it appears that about 4.4 to 4.75 per cent of the refuse material of this size thus can be recovered, and it is doubtful whether this is worth while, as it represents only about 0.3 to 0.32 per cent of the raw feed. Being small-size material, none larger than nut and some much smaller, and as its recleaning involves the use of power and adds to degradation and maintenance costs, its recovery is of doubtful advantage.

Tests of prepared sizes of coal going to market made on Aug. 6, 7, 8 and 9, the most recent data available, showed an average of 4.15 per cent of 1.65-specific gravity sink material in the coal and at the same time an average of 0.35 per cent of 1.65-float material in the refuse. More specifically, the average 1.65-sink material in egg-and-stove coal was 2.81 per cent and the average of 1.65-float material in egg-and-stove size refuse was 0.1 per cent, while the average of 1.65-sink material in nut-and-pea coal was 5.43 per cent and the average of 1.65-float material in nut-and-pea size refuse was 0.6 per cent. Tests, made Aug. 10, of the ash content of the steam sizes showed that buckwheat contains after washing 8.8 per cent ash; rice, 8.9 per cent; barley, 9.7 per cent; and No. 4 buckwheat, 11.8 per cent.

Breaker Construction Details

The breaker and main conveyor are steel-frame structures on concrete foundations, with flooring and pocket lining of plank; structural steel was furnished and erected by the McCarter Iron Works, which also furnished the Chance cones. Siding and roofing are Robertson corrugated-steel felted sheets, and the window openings, which constitute about 20 per cent of the side surfaces, are equipped with steel sash having ventilator sections. Rubber pipe has been liberally used for the discharge lines of pumps by which sand and water are circulated, and also for such water lines as were adapted to its use. All shaking-screen eccentrics and shaft bearings are lubricated from a central point by pipe and hose distribution and Ideal lubricator equipment. The entire breaker is electrically driven throughout, 21 Westinghouse motors of a total capacity of 584 hp. being installed.

The breaker is equipped with electric lighting adequate for continuous night operation and also with all the required audible and visible electric signaling devices. Breaker and main-conveyor structures are furnished with five unit heaters, and this interior heating is supplemented by two banks of stationary pipe radiation below the pockets. The car-loading track and truck-loading road are both closed at each end by hinged doors to minimize the possibility of freezing under the pocket structure, especially at night. The breaker will produce 2,500 net tons in eight hours. In the busy season, it will be operated 20 hours per day, to produce 6,250 tons daily. This will allow 4 hours per day for repairs and upkeep.

The main water supply for the breaker is mine water pumped from the William A Shaft. Additional water can be obtained from the Lackawanna River, but that stream contains a large quantity of washery silt. To clean this river water, it is pumped into a 25-ft.-diameter cone settler at the William A Colliery, from the bottom of which the settled material is allowed to escape and

(Turn to page 387)

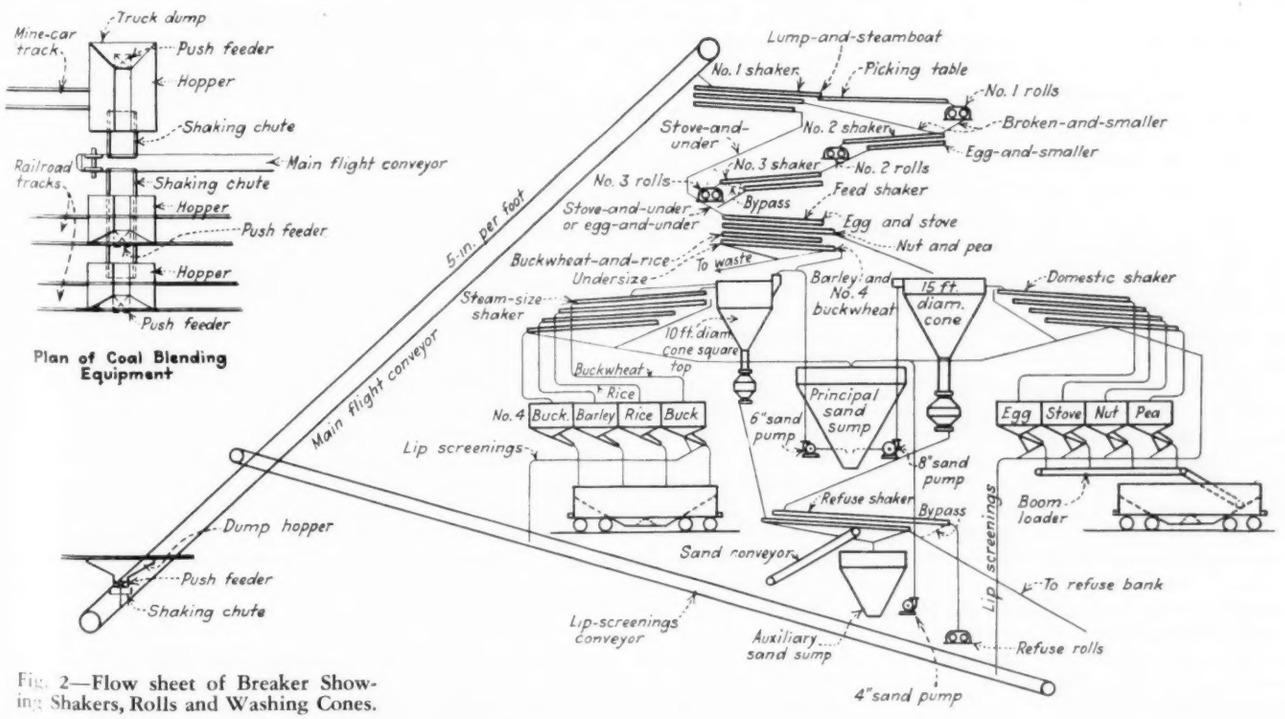


Fig. 2—Flow sheet of Breaker Showing Shakers, Rolls and Washing Cones.

PULVERIZED-COAL PLANT

+ Installed at Nanty-Glo Operation

Of Lincoln Coal Co.

By D. JAMIESON

General Superintendent
Lincoln Coal Co.
Nanty-Glo, Pa.

BECAUSE of the irregular operation of coal mines, the 15-minute-peak-demand clause found in many public utility contracts places an extraordinary power cost on mine operation, especially during summer months, when production is at a low ebb. At the coal mines, also, a large quantity of low-grade fuel is produced which does not have sufficient value to justify the cost of transporting it to the market.

A combination of these conditions brought about the installation of the power plant at the mine of the Lincoln Coal Co., Nanty-Glo, Pa., which was put into operation July 20, 1932. The Lincoln mine, which produces about 1,000 tons per day, has a three-mile haul, and, as the coal is 46 to 48 in. thick, ten long room headings have to be maintained to provide the necessary working faces. All the roadways afford road cleanings in fair quantity, so that five tons of such material is available daily, most of which is of suitable calorific value for power production. In addition to the road cleanings is another source of fuel: the bug dust derived from coal cutting. The heating qualities of this fuel are very good, but if mixed with the regular run-of-mine, its size would increase the percentage of slack unduly and decrease the value of this product. Therefore, by its use in the power plant, not only is a satisfactory fuel afforded but the run-of-mine product is greatly improved.

In 1910, a small hand-fired boiler plant and a direct-current generating station, such as was standard at that time, was installed at the Lincoln mine. This plant was well suited to the small capacity of the mine as then operated, the limited spread of its various headings and its more modest demand for power. When, however, distances and energy demands increased, additional power was purchased for the supply of an underground station. As purchased power costs increased and the original plant became antiquated, the company decided to install a new plant that would accord with modern power-plant practice as far as applicable to this service and would be of sufficient capacity to meet the demands of the mine.

Lack of an adequate supply of condensing water and the low cost of the coal at the mine mouth made it appear advisable to disregard the higher efficiencies of condensing steam units and to adopt driving units of simpler and less expensive type. To make use of such inferior fuel as road cleanings, pulverized-fuel firing had to be adopted, as this fuel could give satisfactory service when fired in pulverized form, whereas when used on stokers or hand-fired it would be a constant source of trouble and annoyance. The boiler plant has two Erie City, 3-drum, 270-hp. water-tube boilers, each fired with pulverized fuel through a single air-cooled burner. Each boiler has its independent motor-driven three-stage paddle mill built by the Erie City Co. Integral with the pulverizer shaft is a primary air fan, which draws the finer coal out of the mill and discharges it through a classifier to the burner. The classifier separates the coarser particles of coal and returns them to the first stage of the pulverizer for further comminution.

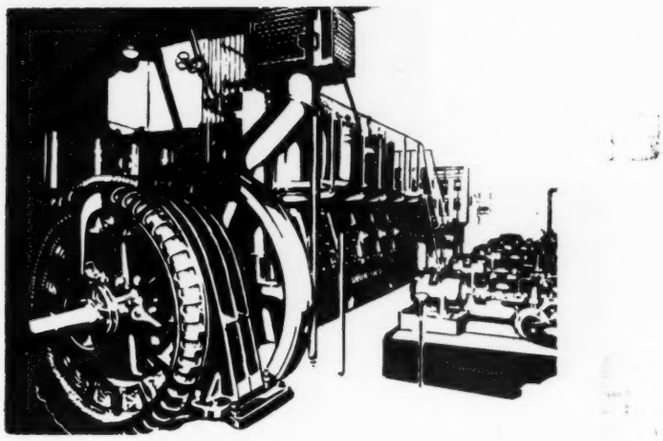
Road cleanings are likely to contain rock, spikes and tramp iron of various kinds, but this does not trouble the pulverizers installed. When the road in the main heading was relaid with heavier rails, many rejected spikes were loaded with the road cleanings, and it was apprehended that these spikes would damage the pulverizers, which were not fitted with magnetic separators, but the throw-out chamber incorporated in the design of the pulverizers was found adequate for the emergency, and no breakage occurred.

The burners are operated with natural draft and supply the greater part of the secondary air to the coal stream and primary air at the burner lip. A certain percentage of the secondary air is supplied through air-inlet doors located at strategic points in the furnace.

As it was realized that the feed-water supply was far from satisfactory and that frequent and routine cleaning of the boiler tubes would be necessary, the plan of operation of the plant was to have one boiler in service and the other off the line for cleaning purposes. In service, however, it was found that this plan of operation could not be maintained, as the needed rate of combustion was excessive for the size of the solid refractory-walled furnace and attempts to get the required steaming load from the operation of a single boiler resulted in excessive furnace maintenance charges. To correct this, both the boilers have been fitted with a rear water wall and a front arch supported on another water wall. This permits the boilers to be operated at 250-per-cent rating continuously without serious maintenance charges.

In the event of both boilers being cold, the plant can be started with a large wood fire in one of the furnaces. This will generate enough steam within a comparatively short time to operate one of the generators and supply current for operating the pulverizer.

The boiler room is located on the hillside below the level of a spur track from the road to the tipple and is fitted with a daily supply bunker, which is fed by dumping mine cars on a tipping table. This bunker is fitted with grizzlies so that any lumps present can be broken by hand. The bunker delivers coal by gravity to the feeding table of the pulverizer, and the rate of combustion is controlled by the speed of that table and by the position of the cut-off knife by which coal at the base of the coal-supply cone on the feeding table is trimmed into the pulverizer. The rate of combustion can be controlled by the fireman by hand manipulation, or it can be auto-



matically regulated at the higher steaming rates by a Smoot combustion control which functions in accord with the steam pressure.

Steam is delivered by the boilers to the engine room at 180 lb. per square inch pressure and about 15 deg. F. superheat. The boilers are not fitted with superheaters, but by arrangement of the tubes and by the circulation of the water, not only dry steam but superheat is obtained.

Embodied in the power plant are a 300-kw. unit and one of 200 kw., driven by a 19x18-in. engine and a 16x16-in. engine respectively, both units being high-speed slide-valve engines operating at 257 r.p.m., non-condensing, the greater part of the exhaust going to the atmosphere through an exhaust head. However, about 25 per cent of the water in the exhaust is recovered by two small shell "dog-house" type condensers. They do not produce any vacuum and are used simply as a means of water recovery, so as to reduce in a measure the 100-per-cent makeup feed that would be needed otherwise in dry seasons. The present condensers are of black iron, and the circulating water used on them is the water supply on its way to feed and filter tanks. Replacement of the present condenser with others of the same design, but made of a special composition of Allegheny metal, and the use of mine water for circulating purposes are contemplated. Such an installation will recover 50 per cent of the exhaust for feed purposes.

The water problem is quite difficult in the summer and not easy at any time. Surface water suffices for eight or nine months in the year and gives satisfactory service. During much of the remainder of the year, water from the borough lines is necessary to complete the supply. This water comes from a stratum of conglomerate below the "A" bed and normally is free of ferrous sulphate, unless water is allowed to enter from higher levels. Boiler scale forms rather rapidly because of the high percentage of make-up required, and a water softener has to be used to render the scale rotten enough to permit of easy and rapid turbining of the boiler tubes.

Mine and surface systems receive electricity from the plant at 2,400 volts. In the power house is installed a 250-kw. synchronous motor-generator set receiving 2,400 volts a.c. from the generators. This energizes the trolley line at the surface and for some distance within the mine. A pole line with a bank of transformers and number of small motors provides 100-volt current at the tipple. Another pole line carries 2,400-volt current to a borehole 7,700 ft. from the drift mouth. Carried down this borehole, it energizes a 200-kw. synchronous motor-generator set which supplies power at 250 volts d.c. A 75-hp. fan receives power from a tap off the pole line. From the foot of the borehole mentioned, a No. 2 armored lead cable carries the 2,300-volt a.c. current underground a further distance of 7,600 ft. to a 150-kw. synchronous motor-generator set with a further line loss of 100 volts. This motor-generator set energizes the trolley lines and supplies the power needed at the face of the workings, which workings extend a mile further in a straight line, with various side lines to room headings, right and left.

At an intermediate point from the power borehole and the remote generator set, 2,200 ft. from the former, is a 150-hp. 440-volt a.c. centrifugal pump which receives current through a bank of transformers from the lead cable. This lifts to the surface, through a 460-ft. borehole, all the water made in the mine which dips from the drift mouth to the face. The face water and that made and received along the road beyond the borehole is lifted at this point by pumps placed at the several low points along the line.

This plant in its two years' operation has demonstrated that the inferior grades of coal, which otherwise would have to be allowed to accumulate at the mine mouth or else be permitted to contaminate the run-of-mine, can be put to useful work when fired in pulverized form.

Kehoe-Berge Breaker, Receiving Blended Feed, Loads 2,500 Tons Daily on Single Track

(Concluded from page 385)

return to the river. The clear-water overflow goes to an old masonry sump, 40 ft. in diameter, by which the colliery was formerly served. There it meets the mine water and is pumped with it by a 2,000-gal. per minute Barrett-Haentjens pump to the breaker.

A Savage lime mixer deposits a measured quantity of hydrated lime in a small water-filled cone at regulated intervals. Water enters this cone by nozzles which keep it in violent disturbance, providing rapid and effective mixing of lime and water. A pipe carries the neutralizing mixture to the suction pipe of the breaker pump, thus providing that the water supplied to the breaker will be of a quality that will not attack screens or other equipment. Connection has been made with the Spring Brook water supply, but this will be used only in emergencies.

A receiving station for purchased power to be used at the properties is located opposite the breaker. Power is received at 12,000 volts a.c. and is stepped down to 4,000 volts a.c. for distribution. This power is stepped down at the breaker and at the various operations to 440 volts a.c.

Little labor is needed for the operation of the breaker. The weighmaster is stationed on a bridge above the railroad-car loading track, from which point he can direct operations on the tracks under, below and above the breaker. As stated, one man operates both cones. All the coal is washed, so only one man is engaged on the picking table, who removes pieces of wood, tramp iron and other refuse that might clog the rolls or obstruct the screens. In all, eight men are employed in the breaker, including the breakerboss and repair man; but 25 are employed at the entire plant, including inspectors, weighmasters, clerks, etc. As the coal is weighed and sold to trucks at all hours in a 24-hour day, this feature accounts for many of the men on the payroll.

COAL SAW

+ Averages 229 Tons Per Shift

At West Virginia Mine

The Saw Has Been Sumped Into the Lamination Below the Top Bench Ready for the Swing Across the Face.

By J. H. EDWARDS

Associate Editor, Coal Age

USING a track-mounted coal saw and auxiliary equipment for cutting and breaking down the coal, the Anjean mine of the Leckie Smokeless Coal Co., Greenbrier County, West Virginia, has been able to average 229 tons per shift for nearly a year in the section in which the machine is working. Mining with this equipment is based on making narrow horizontal and vertical cuts to divide the face into blocks or sections, and these are forced down with the help of a hydraulic breaker pad operated from an oil pump on the saw. Breaker pads and oil hose have been the largest single item of expense in saw operation at Anjean, but this has been reduced to a fraction of the former figure by restricting the use of the pad within its limitations and by a radical reduction in the price of replacements.

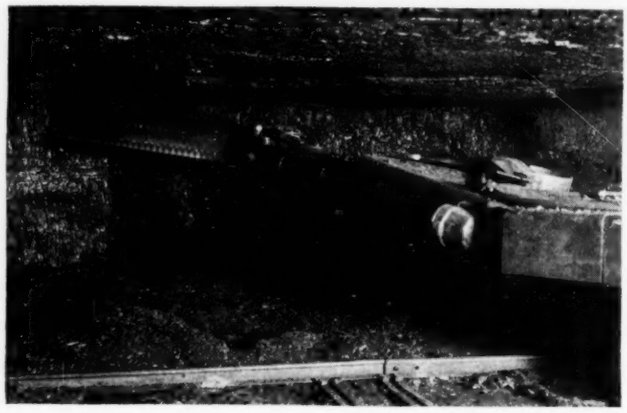
Anjean mine is a drift operation in the Sewell seam lying 3,500 ft. or more above sea level. The coal, of the low-volatile type, is friable in nature and has the columnar structure characteristic of the New River seams. These qualities make it easy to break blocks with a pick for hand loading. The saw used at Anjean—a track-mounted, Type 6-A Joy machine—weighs approximately 6 tons and is designed for rapid sawing of both horizontal and vertical cuts in any position that development and mining may require. Over-all dimensions are: height, 29 in.; width, 5 ft.; length with saw folded back in tramming position, 18 ft. The length of the saw blade is sufficient for cuts 6 ft. deep, and the width of the kerf is 2½ in., or slightly less, depending upon the condition of the bit points. Bits are an integral part of the saw chain. When dull, the entire chain is removed and a new one substituted. This change, under usual operating conditions, requires from 2 to 5 minutes.

The saw chain is driven by a single 30-hp. motor protected by a thermostat and inclosed automatic breaker. This motor also supplies power for the other operations performed by the machine, including tramming. Trailing the machine is a small truck with a motor-driven cable reel. Maximum width of the horizontal cut is 36 ft.; the limit for parallel vertical cuts, however, is 12 ft. from the center of the track. The body of the machine swings about a horizontal axis at the center of the truck, with the result that several feet of side clearance is necessary when the machine is turned to make a vertical cut at the side of a wide room. This has been found to be the only limitation on use at Anjean, as in some sections roof conditions require closer timbering than would provide the necessary clearance.

Several sizes of breaker pads have been tried at the mine, but those approximately 9½ in. wide and 36 in. long are favored. Approximately 500 lb. per square inch is the limit of oil pressure imposed on the pad. Ten seconds usually is required to build up pressure to the point where the coal is moved and approximately the same time is required to pump the oil out of the pad so that it can be withdrawn, even though the space in which it was inserted has been widened by the movement of the coal. Oil-hose connections from the machine to the pad are permanent. When not in use, the hose is doubled back and the pad stored on top of the machine.

Headings are driven 12 to 14 ft. wide; rooms, 18 to 20 ft. The undercut is made by sumping the saw in at the left and swinging the machine to carry the cut to the right-hand corner. Next, a vertical cut is made at the right, the saw being sumped in at the top. Other vertical cuts are made across the face to the left-hand rib, leaving the coal in blocks 4 to 6 ft. long. Some blocks may drop of their own weight, in which case they are ready for the loader. If, however, a block remains in position and appears to be free of the roof, the breaker pad is inserted in the vertical cut, pushed to the back and pressure applied to break the coal down.

Where the coal appears to adhere to the roof, the saw is brought up to cut a slot near the top in the middle of the block to receive the pad. This slot consists of the single sumping cut with the saw blade horizontal. In case a block is "burned" tightly to the roof, the horizontal top cut is carried across the entire width of the block, causing it to drop, in which case the pad is not employed. The saw operator is charged with the duty of using the pad only where maximum pressures are not required and yet to employ it as far as possible to reduce the amount of sawing. Close to 300 places was the service life of the last breaker pad.



Sumping in for the Rib Cut on the Right Side of a Room

A higher percentage of large lump was the major objective in the installation of the saw. This the management feels has been attained, although the saw accounts for less than 15 per cent of the mine output and coal from the saw section has not been segregated, screened and loaded separately at the tipple to determine the exact betterment. Another advantage, but one difficult to evaluate, is the reduction in hazard due to the elimination of explosives. Power consumption per ton is thought to be less, but tests had not been made when this article was prepared.

Pad Being Removed From Slot at the Top Center After a Block Has Been Broken Down.

Room Face Sawed and Broken Down Ready to Load.

Coal From the Saw Section Improves the Appearance of the Lump Output From the Whole Mine.

The saw crew receives 1½c. per ton more than mining-machine crews. Men loading in sawed places are paid 3.1c. per ton less than other loaders, who do their own drilling and shooting. The difference of 1.6c. is the apparent saving to the company, but out of it must come the cost of breaker-pad and oil-hose replacements, as well as other charges growing out of the purchase and operation of the saw. Byproducts of saw operation include a preference for saw-cut places on the part of the loaders and for the coal saw on the part of the operating crew. The skill and interest shown by the latter is credited with much of the success of saw operation by W. S. Leckie, president of the company. The two men comprising the crew were selected from the local mine force and received only a few days' instructions from a demonstrator sent out by the manufacturer.

In the eleven months from Sept. 1, 1933, to Aug. 1, 1934, the saw operated 166 shifts and produced 42,594 tons, or 13.8 per cent of the total output, making the average production 229 tons per shift. Due to conditions attending slack run, a full complement of places was not always available to the saw, and this lowered the average. Improvement with experience is indicated by increasingly higher production per shift. For the first three months the average was 195 tons and for the last three months 238 tons. The maximum for one shift during the latter period was 324 tons. Prior to Sept. 1, 1933, operation was more or less experimental, and the method of pay had not been changed from the day to the contract basis. At the present time, twelve places sawed and broken down is the usual performance of the machine in a 7-hour shift.

Ordinary repair parts purchased during the period aggregated $273.45, or 6.4 mills per ton. Early in the period, before the crew reached its present proficiency, one saw bar was broken and replaced at a cost of $166.50. Two saw chains were purchased at $87 each. Sixteen breaker pads also were bought and at the reduced price for the last received would have cost $135.20. Probably fewer than eight pads will be used in the next period of equal production.

Purchases of Stoodite—the hard material which is gas-welded to the chain-bit-points—totaled $111.14, and the cost of acetylene and oxygen used in its application is estimated by the mine accountant at approximately $100. One chain usually cuts four places before it must be replaced by a sharp one. Three of the five chains on hand usually are retipped with Stoodite after each shift. This operation usually requires 70 minutes per chain, and the cost of labor and material is estimated at close to $1.50.

[THIRD OF A SERIES OF ARTICLES ON THE OPERATION OF DISTRICT SELLING AGENCIES]

OHIO SALES AGENCIES

+ Modeled on Appalachian Pattern

TWO district sales agencies have been organized to handle Ohio coals. Northern Coals, Inc., the older of the two, was originally planned to embrace all districts in that State and also the West Virginia Panhandle field. Southern Ohio producers, however, elected to establish a separate agency—Hocking Coals, Inc.—and the Panhandle operators so far have declined to join with their eastern Ohio brethren. But so great was the faith of the founders of Northern Coals, Inc., in the soundness of the regional selling idea that they started actual operations without waiting to sign up the 70 per cent of the tonnage which the organizers of Appalachian Coals, Inc., had set as the minimum necessary to make the plan effective in their territory.

Preliminary work on Northern Coals began early in 1932 within a few weeks after organization plans for Appalachian Coals were perfected. Completion of that work was postponed pending final decision by the courts in the government suit to have Appalachian Coals outlawed under the Sherman Act. As soon as the Supreme Court set the seal of approval on the regional selling plan, however, organizers of Northern Coals lost no time in swinging into action, and the new agency cleared its first shipment on June 7, 1933. Organization work on Hocking Coals did not get under way until early last year and that agency did not begin to function until Sept. 29, 1933.

Except for minor changes covering the capitalization, the charter powers and provisions for both Ohio agencies are identical with those set out in the certificate of incorporation for Appalachian Coals. The Appalachian charter authorizes the issuance of 1,000 shares of common stock with a par value of $1 per share and 9,000 shares of preferred at $100 per share. Northern Coals was empowered to issue 5,000 shares of $1 par common and 4,000 shares of $100 preferred stock. The Hocking charter provides for the issuance of 1,000 shares of $1 common and 1,000 shares of $100 preferred stock. Appalachian and Northern Coals preferred stock is 7 per cent cumulative; Hocking Coals preferred is a 6 per cent cumulative issue. Voting power in all three corporations is vested in the common stock.

Right is reserved by each agency to redeem the preferred stock in whole or in part at par plus accrued dividends on any dividend date. The bylaws of all three corporations give them the option of repurchasing the common stock of an individual holder at book value "(a) if the corporation should cease to be the exclusive selling agent for all coal produced by the holder in any of the groups" covered by the operations of the agency, (b) "if he shall cease to produce coal, or (c) shall violate any present or future contract which he may have with the corporation, or (d) if title to the shares of the holder, or any of them, shall, either voluntarily or involuntarily, pass to another."[1]

In Hocking Coals, however, the option to repurchase stock in the event that a stockholder should sell all or part of his mines is qualified. Where the new mine purchaser is already selling his coal through the district agency or is willing to make it his selling agent, the original stockholder may transfer his shares in Hocking Coals to the purchaser of his mine or mines on a pro rata basis.[2]

The underlying basis of stock allotments is the same for all three agencies, but the details differ. Each stockholder in Appalachian Coals is entitled to subscribe for one share of common stock and for one additional share for each 100,000 tons or major fraction thereof of production in 1931. Where no subagent was to be appointed, preferred stock subscriptions were on the basis of one share for each 66⅔ tons or major fraction thereof of average monthly

[1]Appalachian Coals, Inc., Bylaw 42; Northern Coals, Inc., Bylaw 36; Hocking Coals, Inc., Bylaw 36. "Such option may be accepted by the corporation as to all or any number of the shares subject thereto at any time after such event, but not later than 30 days after the certificate or certificates for such shares are presented to the corporation for transfer, nor in any event not later than 20 years from the date of the original issuance of the shares subject thereto, by mailing a written acceptance to the holder at his address as shown on the books of the corporation."

[2]"The number of shares of stock subject to transfer to said purchaser, or subject to option to repurchase by the corporation, shall be such pro rata part of the number of shares owned by the seller of the mine or mines as the annual production capacity at the mine time, of the mine or mines sold, is to the aggregate annual production capacity at the time of all the mines of the seller."

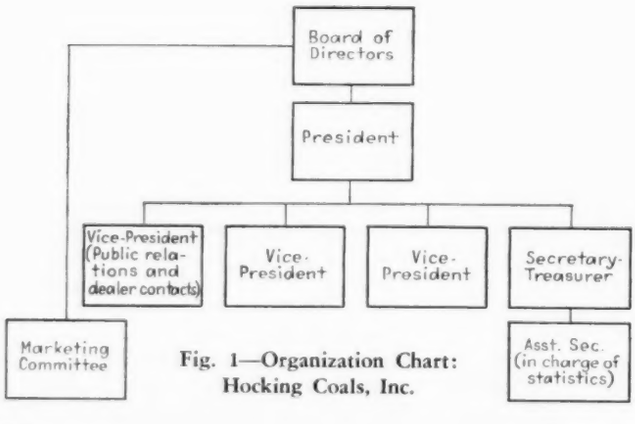
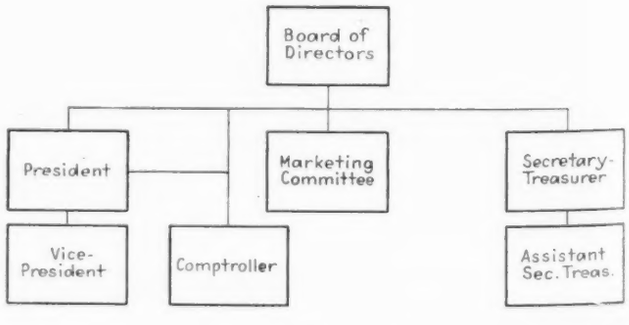


Fig. 1—Organization Chart: Hocking Coals, Inc.

Fig. 2—Organization Chart: Northern Coals, Inc.



production in 1931; where sub-agents were appointed, the basis of subscription was one share for each 666⅔ tons or major fraction. Common stock allotments in the Ohio agencies were on the basis of one share to each stockholder plus one additional share for each 10,000 tons or major fraction thereof of "rated capacity." This "rated capacity" was originally arrived at by multiplying the largest output produced in any three consecutive months of 1929, 1930 or 1931[3] by four.[4] Where the stockholder appointed no sub-agent, preferred stock was to be allotted on the basis of one share for each 800 tons of rated capacity in Northern Coals and 3,200 tons in Hocking Coals. Where coal was handled through sub-agents, the basis of subscription was one share of preferred for 8,000 tons in Northern Coals and one share for each 32,000 tons in Hocking Coals. At present, however, neither Ohio agency is engaged in direct selling but works exclusively through sub-agents.[5]

The framework of the contracts between the sales agency and the individual producers, and between the agency and the sub-agents designated by the producers, is the same for all three corporations and the language of many of the provisions in the Ohio agreements is identical with that found in the Appalachian Coals contracts. In a number of sections, however, the phraseology of the Ohio contracts has been modified considerably. For the most part, these modifications are expansive and lay down detailed procedure for meeting certain contingencies which might arise in the enforcement of the more broadly phrased provisions of the Appalachian contracts.

Under all three setups, for example, tonnage still due on contracts uncompleted at the time the producer became a stockholder in the district agency is excluded from the provisions of the sales agency agreement. In both Northern Coals and Hocking Coals, however, commission must be paid the agency on tonnage shipped on such contracts subsequent to the time the producer joins the agency. Northern Coals specifically excludes captive tonnage—a class of business not even mentioned in the other two agreements—and, under certain conditions, eliminates non-captive railroad fuel from calculation and control.

Appalachian and Hocking contracts fix a commission of 10 per cent of the gross selling price f.o.b. mines for the sales agency. The Hocking contract

[3]In the case of Hocking Coals, the largest shipments for any three consecutive months' period in 1929, 1930, 1931 or 1932.

[4]The sales agency contracts of Northern Coals provide for the deduction of all captive tonnage in arriving at the "rated capacity." No such qualification is made in the other agreements.

[5]On Sept. 1, 1934, there were nine producer-stockholders of Northern Coals and the same number of sub-agents; Hocking Coals had seventeen producer stockholders and seventeen sub-agents.

William Emery, Jr.
President, Northern Coals, Inc.

further provides that the directors of the agency may vary the commission from time to time so as to pay the selling agent 8 per cent of the gross selling price plus a fixed amount in cents per ton, subject, however, to the limitation that the sum of these two figures shall not exceed 10 per cent of the gross selling price.[6] Under its original contract, Northern Coals is entitled to a commission of 10 per cent of the "average" selling price, figured separately for each size and grade, of all coal sold by it.[7] In determining "average" prices for each grade, shipments on pre-existing contracts and premiums over the selling agent's minimum "authorized" prices received by sub-agents are excluded. Sub-agency commissions under both Ohio organizations are fixed at 8 per cent of these "authorized" prices[8]; Appalachian sub-agents are allowed 8 per cent of the actual selling prices.

All three agencies covenant to use their best efforts to sell the output of their stockholders at the best prices obtainable[9], in the same markets and to the same customers "under the mine names or trade name or names that the producer has heretofore sold such coal." All three agency contracts, also contemplate proration and allocation of tonnage between member stockholders when demand is insufficient to absorb potential production. Subject to market-demand variations in sizes and grades, the Appalachian monthly quota basis is fixed by the percentage the individual producer's total car allotment for the second preceding month is of the total car allotment of all the producers whose coal is sold by Appalachian Coals for the second preceding month. Ohio quotas are determined on the basis of the "rated capacity" of the member stockholders.[10]

While the original bases for these "rated capacities" are definitely fixed in the Ohio agreements, provision also is made for re-ratings where changed conditions—such as actual performance for a three months' period, double-shifting, opening new mines or abandoning old operations—warrant such action. In the interest of "efficiency of operation," specific permission is given to a producer with more than one mine to apply the total of its allotment among its mines at will, provided that any mine which is idle is "properly maintained—i.e., pumped, posted, developed, fully equipped and ready within 30 days to produce its rated capacity." Producers controlled by the same interests also are privileged to treat their operations as a single unit under the "efficiency of operation" section. Neither captive tonnage nor railroad fuel shipments are charged against the rated capacity of Northern Coals producers in allocating tonnage.[11] Under the Hocking agreement, a producer may assign his quota to another producer selling through that agency for a period of not less than three consecutive months.

Failure of a producer to object to the classification in which its coal is placed within 20 days after notice of such classification by Appalachian Coals makes that classification "final and binding on the producer until a different classification has been made by the sell-

[6]At the present time, operating under this provision, the Hocking commission is 8 per cent of the gross selling price plus 5 mills per ton. Although there is no specific provision on the subject in the Appalachian contracts, as stated in the preceding issue (*Coal Age*, September, 1934, p. 348), the Southern agency voluntarily reduced its commission rate last year.

[7]By a supplemental agreement, effective June 7, 1933, the compensation of Northern Coals was fixed at ¼c. per ton plus 8 per cent of the authorized minimum selling price. This modification of the original contract expires Dec. 31, 1934. This supplemental agreement also substitutes settlements on the basis of the actual selling prices (exclusive of premiums over that price earned by sub-agents) for "average" prices during the existence of NRA code prices.

[8]Said commission of 8 per cent, it is specified in the Northern Coals sub-agency contract, is to be figured on the actual selling price on a mine basis less any premium in excess of the minimum price below which the sub-agent may not sell, but prior to deduction for allowances and adjustments, regardless of whether such deductions be on account of a complaint resulting from causes within the control of the producer, the selling agent or the sub-agent. The Hocking contract makes no mention of premiums.

[9]This is qualified in the Ohio contracts to read: "At the best possible prices obtainable, but at prices not prejudicial to the consumer-public interest and at such prices as will allow the producer to pay its employees a fair and equitable wage and in addition thereto receive a fair and equitable return on its investment."

[10]Under the Northern Coals supplemental agreement, all provisions for allocation of tonnage during the life of existing sales agency contracts were suspended.

[11]The contract provides, however, that: "No coal shipped to a railroad, which involves movement via the Great Lakes, and no coal shipped to a railroad whose supply of coal is now classed as captive tonnage but whose supply of coal at any time hereafter ceases to be such shall be embraced within the term of off-line 'railroad fuel' except by a two-thirds vote of the entire membership of the board of directors of the selling agent."

ing agent." This time limit is eliminated in the Ohio agreement.[12] Where a reclassification is made as a result of complaint by the producer, the Ohio contracts provide that all expenses in connection therewith shall be divided equally between producer and selling agent; if no reclassification is ordered, the producer must bear all the cost. The Ohio agreements also specify that tipple inspections of shipments by the selling agent shall be at the agent's expense. Old labor troubles and government dictation echo in the expansion of the specific causes relieving Ohio producers from liability for failure to make shipments.[13]

The Ohio contracts follow the provisions of the Appalachian agreement which authorize the selling agent, after opportunity has been given the producer to investigate the claims, to make allowances and adjustments with purchasers on complaints resulting from causes within the producer's control and to charge back the cost thereof to the producer[14]. Allowances made for causes within control of the selling agent must be borne by it. Sub-agents may make no allowances or adjustments for causes within the control of the producer without the specific authorization and approval of the selling agent. Any allowances or adjustments due to causes under the control of the sub-agent must be absorbed by the sub-agent and shall not affect the net return to the producer or selling agent.

None of the agencies is authorized to commit a producer to a contract for delivery extending over a period of 60 days from the effective date thereof without his consent and signature. The Appalachian and Hocking contracts, however, further specify that the rejection of any contract tendered "may necessarily result in the restriction of the pro rata share of the business on such grade of coal as is available for distribution by the selling agent." Special provisions in the Ohio contracts covering lake-cargo trade authorize these agencies to make such arrangements as they deem necessary for the payment of transportation, unloading and storage charges and, in the case of consignment coal, to allot the tonnage among different producers[15].

Any controversies arising under the contracts, including complaints involving classification and, in the case of the Ohio agencies, "rated capacity," which the parties at interest are unable to settle are subject to adjudication by an arbitration board of three "disinterested and competent persons versed in the coal trade," whose findings and decision shall be binding on both parties. One arbiter is selected by the selling agent, one by the producer (or, if the issue arises under a sub-agency contract, by the sub-agent), and these two choose the third member of the board. Under the Ohio contracts, definite time limits are set for selection and decision.[16]

Except for a clause in the Northern Coals contract giving the agency the right to cancel the designation of a sub-agent if, upon investigation, the board of directors of Northern Coals believe that the "sub-agent is not a bona fide selling agent"[17], provisions governing the appointment and functions of sub-agents follow the same general pattern in all three organizations. There must be satisfactory evidence of the financial responsibility of the sub-agent, or, in the case of Northern Coals, a guarantee of performance by the producer; the producer can revoke the designation whenever he becomes dissatisfied with the credit standing of the sub-agent; or he may cancel the appointment on 30 days' notice "for any reason appearing sufficient to the producer."

If, during periods of slow demand, a sub-agent makes sales contracts for tonnage in excess of his producer's pro rata share, the selling agent is empowered to offer the excess tonnage to other producers of like character of coal. Under the Northern Coals contract, the producers or his sub-agent has the right to inspect, at the expense of the selling agent, the coal delivered from mines of other producers taking this excess tonnage and to complain "to the selling agent if said coal is not the equal in all respects of the coal of the producer which would have been shipped on said contracts except for the allotment made."

Both the Appalachian and Hocking contracts specify that, if the producer sells, ships, fails or refuses to ship coal as directed by the selling agent, the latter may purchase other coal to fill any contract which it may have made for the sale of that producer's coal and to charge that producer with any difference in price. No provision for outside purchase, however, is embodied in the Northern Coals contract. When a producer abandons operations or sells his property to a buyer who withdraws the tonnage from the commercial market, the sales contracts of all three agencies provide for the termination of the agreement except as to the performance of contracts then in force for the delivery of coal. "As to such unexpired and uncompleted contracts," the Ohio agreements add, "the producer shall,

---

[12]The Hocking Coals contract provides that objection may be made "within such initial period of 20 days or subsequently." Northern Coals qualifies "subsequently" by adding "but not more often than once in three months."

[13]The Appalachian agreement on this subject specifies strikes, lockouts, car shortages "or any other cause" beyond the control of the producer; to these, the Ohio contracts add "war, war conditions, insurrections, mine disasters or breakdowns, mine fires or other accidents at the mines, interruption of car service, labor agitations and disturbances, shortages of labor supply and orders of any governmental body affecting the distribution, routing or delivery of coal or cars."

[14]The Appalachian and Hocking agreements provide that such deductions shall be made from the price of the coal before the commission of the selling agent is computed; the Northern Coals contract has no similar provision.

[15]"As to coal sold in pursuance of this agreement for delivery at points on the Great Lakes and waters tributary thereto, for transshipment by vessel, and as to coal shipped to coal docks at said points upon consignment, or for storage, sale and distribution from such points, the selling agent may make such contracts with sub-agents and/or others for the payment of railroad freight and water transportation and for discharging, storing and delivering said coal as, in its discretion, it considers necessary and proper. All charges and obligations incurred in connection with such freight transportation, discharging, storing and delivering said coal shall be deducted and paid before ascertaining the amount which the selling agent is entitled to receive on the sale of said coal. On coal so handled the time of settlement with the producer and other provisions of this agreement inconsistent herewith are modified and varied to conform to the provisions and requirements of such contracts.

"In the case of consignment coal above referred to, the selling agent may call upon all producers shipping coal of the classification included in said consignment to share pro rata in said consignment coal, in order that the burden of carrying the same may be ratably distributed; and, if any producer to whom any of such consignment coal is allotted shall refuse to ship such allotment, such tonnage shall be charged against the allotment of such producer; provided, however, that such charges against a producer's allotment shall not be made if such consignment coal is to be shipped to a dock, any part or all of which is controlled, operated, leased or used by a company with which the sub-agent making the consignment transaction, or its producer, is affiliated."—Sec. 11, contract between Northern Coals and producer members. Except for the final proviso with respect to coal shipped to a dock affiliated with the producer or its sub-agent, which is omitted from the Hocking contract, the language of the section in the two contracts is identical.

[16]"Upon a disagreement occurring, either party may notify the other, in writing, that it elects to have the matter referred promptly to arbitration, and, within ten ten days after receipt of such notification, each party shall select an arbitrator, and, in writing, notify the other of the person so chosen, and, the two persons so chosen shall, within fifteen days thereafter, choose a third person with like qualifications, and the three persons so chosen shall proceed forthwith to settle the question or questions at issue, and the decision of said three persons, or of any two of them, shall be reduced to writing and delivered to the parties hereto within not more than thirty days from the final submission of such controversy for decision, and such award shall be binding upon the parties hereto, and shall be promptly complied with and carried out. In case of the death or disability of any arbitrator, his successor shall be chosen within five days thereafter by the party appointing him, or if he be the third arbitrator appointed, then by the two arbitrators already appointed and acting. In case of the refusal or failure of either party to this agreement to appoint an arbitrator within the ten-day period, or in case the two arbitrators appointed by the two parties hereto shall fail to agree within said fifteen-day period upon a third arbitrator, or within said five-day period upon a successor to said third arbitrator, such arbitrator shall, upon application of either of the parties hereto, be appointed by a judge of the District Court of the United States for the Northern District of Ohio, Eastern Division (federal district judge for the Southern District of Ohio, Eastern Division in the Hocking contract). The arbitrators in rendering their award shall fix a reasonable amount for their compensation, and such amount, together with any other proper expense of the arbitration, shall be borne and paid equally by the parties thereto. [The Hocking contract assesses costs against the losing party.] Except as the same may be inconsistent herewith, the U. S. Arbitration Act, including all amendments, shall be applicable hereto." This last sentence, however, does not appear in the agency and sub-agency agreements of Hocking Coals.

[17]This decision is not reviewable under the arbitration clause.

upon the request of the selling agent, furnish its ratable proportion of the tonnage of coal required to fill the same."

Sub-agents for all three organizations agree to use their best efforts to sell such coal as they are authorized to sell "in such amounts and in accordance with such classifications as the selling agent may designate and upon such terms and conditions and at the price or prices[18] established by the selling agent from time to time" and to guarantee payment of all accounts for coal so sold. Departure from any of these terms without specific authorization gives the Ohio selling agencies the right to cancel the sub-agency contract. Northern Coals sub-agents further covenant that, as long as the selling agent can fulfill the sub-agent's requirements of the kinds and grades of coal produced by mines represented by the selling agent, the sub-agent "will only sell coal of such kinds and grades which is furnished by the selling agent."

Appalachian Coals, with its 146 stockholder producers, controls approximately 73 per cent of the commercial tonnage of the fields in which it operates and, it is estimated, will handle approximately 45,000,000 tons through its 130 sub-agents during the present calendar year. Northern Coals controls only 40 per cent of the aggregate output of the No. 8, Cambridge, Middle and Bergholz districts in eastern Ohio and probably will not clear over 6,000,000 tons through its 9 sub-agents in 1934. Hocking Coals, controlling about 80 per cent of the tonnage in the Hocking, Pomeroy, Crooksville and Jackson districts, hopes to move approximately 4,000,000 tons through its 17 sub-agents this year. These differences in volume are directly reflected in a more skeletonized organization setup for the Ohio agencies, a very much smaller personnel[19], and in the restriction in the scope and volume of the activities undertaken by Northern Coals and Hocking Coals.

Nowhere is this more apparent than in the internal organization shown in Figs. 1 and 2. In both agencies, the marketing committee, which is not a full-time group in the direct employ of the selling agent and, except for the matter of compensation, corresponds to the former sales committee of Appalachian Coals (see *Coal Age*, August, 1934, p. 312), reports directly to the board and not through the president of the selling agent. This line of authority is explained by the fact that the presidents of both Ohio agencies are not full-time employees of the corporation, but are actively engaged in heading up their own mining companies. For the same reason, the comptroller of Northern Coals reports both to the board and to the president. Except as one vice-president of Hocking Coals is specifically charged with supervision of public relations and dealer contacts, no machinery comparable with that existing in Appalachian Coals has been set up by the Ohio agencies for market research and development, engineering research and general promotion.

Both Ohio organizations use the copies of the invoices sent in by their sub-agents as the basis for the compilation of statistical data on distribution and follow, in somewhat less detail, the same general routine employed at Appalachian Coals and described in the preceding issue of *Coal Age*. Headquarters of Northern Coals at Cleveland checks an average of 4,000 invoices per month; the average number of invoices handled monthly through headquarters of Hocking Coals at Columbus approximates 6,500. A card record of contract performance is kept by Hocking Coals, but no attempt is made by either agency to set up individual card records for "orders" of ten cars or more to be shipped within 60 days. Northern Coals maintains a complete individual record of performance on all contracts and orders.

E. H. Davis
President, Hocking Coals, Inc.

Northern Coals has leased punching equipment from a tabulating company and tabulates the following data from invoices submitted covering each shipment made by member producers to customers: total tonnage, total realization thereon, premium size, grade, price, zone destination, destination (city and State), routing, whether old or new order, whether code or pre-code order, date of shipment, producer and sub-agent. With this basic information punched in tabulating cards the agency may request the tabulating company to make any subsequent classification of data or sorting of records which may be desired. Appalachian Coals, it will be recalled, leases the tabulating equipment and does all the work of punching, tabulating and sorting in its own accounting and statistical division. Compilation of data at Hocking Coals is wholly manual; the desired information for reports to members is drawn from the invoices, but, except in the case of contracts, is not transferred to cards for permanent filing.

Hocking Coals furnishes its stockholders and their sub-agents with monthly reports showing: (1) distribution by sizes to major consuming markets, broken down into five States and 39 specific destinations, viz., 21 cities in Ohio, 6 in Indiana and 12 in Michigan; (2) realizations by sizes on both new and old orders for the individual company receiving the report and average realizations under the same classifications for all coal cleared through the agency; (3) sales by uses (railway fuel, public utilities, general industrial, domestic and lake) and by sizes (nut-pea-and-slack, nut, egg, lump, block, straight mine-run and resultant mine-run), and average realization per ton for each size in each use classification; (4) sales by sizes, with average realization per ton for each size, from each of the four originating groups in Hocking Coals. In addition, Hocking Coals makes weekly and monthly reports on production and working time for each individual mine of its stockholders.

In analyzing the distribution of eastern Ohio coal, Northern Coals uses the following consumer classifications: (1) retail domestic; (2) industrial steam; (3) electric utilities; (4) municipal, (a) power plants, (b) water works, (c) garbage incinerator plants, (d) hospitals, (e) welfare institutions, and public schools; (5) State institutions; (6) federal institutions; (7) producer gas; (8) railway fuel; (9) lake-cargo coal; (10) vessel fuel; (11) unclassified dealer business. Monthly tabulations of tonnages shipped and realization thereon are made by Northern Coals classified by: (a) consumer classifications, as herein outlined; (b) grade and size; (c) producing districts; (d) code and pre-code; (e) destinations, including States and cities, towns, or villages within States and also by uniform Code Marketing Areas (lake shipments further classified by lower lake ports); (f) individual transportation companies, including originating, connecting and delivery lines. These data are available for the use of all stockholders. Monthly reports mechanically prepared from the tabulating cards are made to each producer. These reports set forth the details of each invoice covering all transactions for the period and also form the basis for the monthly settlements between the producer, selling agent, and its sub-agent.

[18] Ohio contracts read: "at not less than the price or prices established."

[19] As of Sept. 1, 1934, Appalachian Coals had 154 full-time employees on its payroll; Northern Coals 10, and Hocking Coals 10.

NOTES

. . . from Across the Sea

THOUGH the steam-coal measures of South Wales are generally dry and though much of the coal field is deep, in some places 2,000 ft. below sea level and 2,400 ft. below the surface, J. Macleod Carey, divisional inspector of mines, and president, South Wales Institute of Engineers, in his presidential address to that institute, proposed a scheme for draining the entire area through two tunnels, one 21¾ miles long and the other 11¼ miles.

Reason for this suggestion is that the outcropping mines to the north are becoming worked out and abandoned and the Pennant and Llanwit measures above the steam-coal measure, as also the Pennant sandstone itself, are wet. The shafts through the upper measures have been carefully tubbed, and no great quantity of water comes from them, but with water in these measures some is likely to enter the steam-coal seams and make trouble. In fact, much trouble, especially from abandoned outcropping mines, is beginning to be experienced.

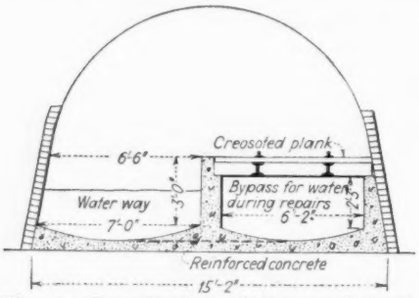


Fig. 1—Cross-Section of Proposed South Wales Water Tunnels.

The eastern, or 21¾-mile, water tunnel would end at an elevation of 135 ft. above sea level in the workings of the Gellideg seam at Aberdare, in which workings it would fall 110 ft. and deliver its water into the River Usk at Malpas, near Newport. The western tunnel would end in No. 3 Rhonnda seam in Mid Rhondda and would discharge in the River Ewenny, near Bridgend. The tunnels would be 15 ft. 2 in. wide inside the lining and have a waterway on one side 7 ft. wide and 6 ft. deep. On the opposite side, a track would be provided for removing fallen rock and silt and for transporting repair material. Under this track would be provided a bypass for water during repair of the main waterway (Fig. 1).

It may be noted that many seams would be largely dry if a tunnel took off outcrop water and ground and other water from the measures above. The value of a tunnel may be inadequately measured by the depth of its drainage. It may fail to reach, as do these tunnels, large areas of opened or proposed workings, but may nevertheless drain off a large percentage of the water which otherwise would drain into them.

SPONTANEOUS COMBUSTION continues to be a frequent menace in some Scottish and English mines, and water pipes have to be laid ready for every emergency. At Wellesley colliery the Dysart Main seam occurs at a depth of 1,800 ft. under a deep arm of the sea known as the Firth of Forth. This seam in the dip section is 11 ft. 6 in. thick, but the actual coal in the bed is only 9 ft. 5 in. thick, of which 7½ ft. only is recovered, as the center portion has 16 in. of rock with only 3 in. of coal. The coal is mined in two benches, in both of which fires have occurred. Harold Baird, at a meeting of the Scottish Mining Students' Federation, in Heriot-Watt College, Edinburgh, Scotland, recently described the procedure followed to protect the mine from fire and to extinguish such fires as occur.

To increase safety, all posts are of steel, the only wood in the section being cap-pieces, ties and the stilts used under steel arches. The policy of the company is, wherever possible, to excavate and remove burning coal, rather than to attempt to stifle it by sealing. Four-inch-diameter pipes are laid in each section to provide a prompt water supply. All cap-pieces are withdrawn when the steel posts under them are removed and after each shift of the face conveyor, rock dust is spread over the waste in the longwall, thus putting a protective coating over the small coal unavoidably left behind, and preventing its oxidation.

To enable workmen to pour water directly on the fire, long sectional hoes and pokers are provided so that burning coal can be turned over or brought down from the face. Hose stands also are provided, so that water can be played on the fire while the men remain at a safe distance. Fire cars with complete equipment are furnished. This equipment includes a reviving apparatus, a smoke helmet, six safety hats, three hose, two hose stands and other equipment.

Speeds of 24.4 to 30 ft. per day are being attained in driving rock tunnels, declares Dip.-Ing. A. Weddige, in *Glückauf*, though 6½ ft. is the average rate of progress in the Ruhr coal field, with a maximum of about 13 ft., showing the need for a study of development methods.

ANYTHING and everything available is being used for tamping, but doubt has arisen as to the value of clay because shots which have brought down the coal have thrown out the plug of clay by which they were believed to be confined, and the escaping hot gases might well ignite methane.

In a recent report to the (British) Safety in Mines Research Board, Prof. J. A. S. Ritson and H. Stafford (Bulletin 84, British Library of Information; 17c.) declared that tamping that the shot cannot displace should be used, as it has the following advantages: (1) Prevents blow-out shots, with possible projection of flame and hot gases into mine atmosphere; (2) reduces fumes to a minimum; (3) decreases quantity of explosive needed to perform a given work; (4) decreases quantity of fine dust thrown into air by blast. A shot may shatter or bring down coal, and at the same time blow out the tamping, justifying its description as a "blow-out shot."

To ascertain the value of clay as a tamping material, several vertical holes were drilled in limestone and the shot was confined with the former material. The holes admitted a 1¼-in. diameter cartridge, were from 3 to 7 ft. long, had stemming 2 ft. to 5 ft. long and were charged with 8 to 24 oz. of Polar Saxonite—a 25 per cent nitroglycerin explosive. On every occasion they blew out, and in all but one case left a lining of clay in the shothole. With sand stemming, on the other hand, only one shot blew out and this had been overcharged, having 10 oz. of the explosive and only 18 in. of stemming in a hole 30 in. long. All the other sand-stemmed shots, whether normal or overcharged, failed to blow out, though none had more than 3 ft. of sand stemming and one overcharged 5-ft. hole had only 2 ft. of sand stemming and 30 oz. of the explosive.

Shale dust gave better results than clay. The authors declare that with soft or hard clay, over 4½ ft. of stemming is needed to prevent blow-outs; with limestone dust or shale dust, 2½ to 2¾ ft. is necessary; and with sand, 1½ to 1¾ ft. will suffice. So long as the quantity of explosive is correctly proportioned to the work to be done, the length prescribed for any class of stemming will prevent a blow-out almost regardless of the quantity of explosive used.

If the requisite 18 in. of sand is put in the hole in short plugs separated by other short plugs of clay, the stemming will serve its purpose, but if there is less sand, even though the clay added may have an aggregate length of 2 ft., the stemming will blow out. With blasting powder, 2 ft. of sand should be used. A slow explosive has a greater power of ejecting stemming than one which is more rapid in its action.

With holes in coal, 1¾ to 2 ft. of clay stemming was needed, ¾ to 1¼ ft. of rock-dust stemming and ¾ to 1 ft. of sand. The authors found that the quantity of stemming needed was independent of

the weight of explosive used, if the charges were well proportioned to the work to be done; that the length of stemming must be increased in proportion to the hardness of the rock; and that slow-acting explosives, such as blasting powder, require more stemming than high explosives in the ratio of about 5 to 4.

Unfortunately, sand, though it resists ejection by the explosive, also resists placement by the charger when he fills the hole. A 2-in. plug of sand can hardly be pushed into a drillhole, and even shorter lengths will stick sometimes, so clay dried at 105 deg. C. was ground to pass a 50-I.M.M. mesh (about 48-Tyler mesh) screen and mixed with sand, enough water being added to form such a strong molding mixture that the cartridge could be dropped 3 ft. to the floor without breaking. The sand used was coarse washed river sand, 13 per cent of which passed over a 0.1-in. aperture and less than 2½ per cent passed through about 240-mesh (Tyler standard) screen. China clay and certain surface clays proved satisfactory, but not fireclay. Between three and four parts of sand was used per part of clay, depending on the kind of clay used. However, some clays were so soft that equal proportions of clay and sand were necessary to prevent ejection. Calcium chloride (3 to 5 per cent) was added to keep the clay moist and to enable it to retain its binding qualities. It was found that a 3-to-1 mixture of sand and clay makes a stemming material as efficient for practical purposes as sand alone.

R. Dawson Hall

On the ENGINEER'S BOOK SHELF

Requests for U. S. Bureau of Mines publications should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C., accompanied by cash or money order; stamps and personal checks not accepted. Orders for other books and pamphlets reviewed in this department should be addressed to the individual publishers, as shown, whose name and address in each case is in the review notice.

Accident Experience and Cost in Wyoming Mines, by D. J. Parker. Information Circular 6,791; 14 pp. Mining Anthracite Without Roof-Fall Accidents at Colonial Colliery, Colonial Colliery Co., Natalie, Pa., by R. D. Currie. Information Circular 6,783; 9 pp. U. S. Bureau of Mines.

The first of these monographs is necessarily rather cryptic, as it divides the mines of the State into nine unequal groups and gives for each details regarding the number of accidents of various kinds, days lost on the Wyoming basis of calculation, frequency rate and severity rate; but, as the companies in the various groups are not given nor locations, the reader will be little enlightened. Severity rates run from 1.47 in one small group to 36.03 for another somewhat larger group. The largest group, judging by man-hours worked, shows a severity rate of 15.81. This group operated 5,195,896 man-hours within the period of record, 1927-1932 inclusive. The frequency rates accord in general with the severity, the same three groups having frequency rates of 44.02, 103.88 and 74.09, respectively. Direct costs were 0.76c., 6.53c. and 2.11c. per ton. This, which includes medical and hospital administration and compensation, shows the wide variation in the record of the eight groups.

Mining conditions, methods, practices, machinery, ventilation, supervision, timbering, organization, education, discipline, first-aid training and protective clothing at the Colonial Colliery are discussed in the second circular. Statistics of accidents, nationality, age of employees and foremen's records are given at the end of the report, but nationality and age have not been related statistically to accidents.—R.D.H.

Les Ressources Minérales de la France d'Outre-Mer; I—Le Charbon. Société d'Editions Geographiques, Maritimes et Coloniales, Paris, France. 245 pp., 6½x9½ in.; paper.

This record of the coal resources of France which lie beyond the seas by which that republic is bounded covers the coal deposits of Northern French Africa (Tunis, Algeria and Morocco), Madagascar, French Indo-China and New Caledonia. It is perhaps too early to ask for estimates of the resources available, and the authors do not essay to supply any such information, but they give production, importation and consumption statistics.

In the basin of Djerada, Northern French Africa, in eastern Morocco, are four beds, one 17 in. thick with a 2-in. binder, another 15 to 24 in., a third 16 in. with a 2-in. binder, and a fourth 12 in. thick; not very generous in view of the beds with which such coal must compete.

In the basin of La Sakoa, Madagascar, are beds aggregating from 31 to 35½ ft., excluding in the reckoning all beds less than 2 ft. thick. Some of these beds are 20 ft. in thickness. This field is said to contain about 350 million tons, excluding all coal of depth exceeding 1,640 ft. The fuel has a sulphur percentage of 0.6 and an ash percentage of 10 to 22, and 25 to 34 per cent of volatile matter.

The immense thickness and excellence of the Indo-Chinese coal is well known and has been recorded in *Coal Age*, Vol. 24, pp. 207-209. The New Caledonia coal is not suited for coke, but at one time was used with coal from Australia for the making of briquets; these mines were abandoned in 1931.—R. Dawson Hall.

Courbes Relatives aux Opérations du Classement et du Lavage des Charbons, by O. Dupuis and E. Evrade. Librairie Polytechnique ch. Béranger, Paris, France. 44 pp., 5½x9 in.; paper.

Size and washability curves have their origin in France—the fair land from which we get Cartesian coordinates. These curves have had wide vogue in this country. The latter curves grate a little on our sensibility, because the vertical axis starts with 100 at the origin and runs down to zero at the top, contrary to our tradition and doubtless to the tradition also of Europe. In fact, the first figure is constructed with both zeros at the origin of coordinates. One cannot see why a change cannot be made in washability curves to conform with common practice, with the origin of coordinates made zero for either direction. A movement of that kind has been started in this country.

After preliminary consideration, the booklet deals with the construction of curves relating weight to size of product, and volatile matter and ash also to size. The authors advocate separating out of each size a sample of the best coal and labeling it "practically pure coal," and a sample of the worst material in the sample, terming it "practically pure refuse (pierres)." Each of these samples should be tested for density and ash content and the results plotted against size in four curves.

Then follow a study of washability curves and how they may best be applied to practical problems. This is followed by a study of the means of determination of what the authors term the fundamental curve. They conclude with these remarks: Such curves "should take in consideration the form of the elements, their size and their composition. We have shown that the methods actually in use do not possess these qualities, and we have indicated a method which leaves nothing to be desired. This last demands a simple method, reliable and easily performed. We would like to see this method used in general practice." Several diagrams follow.

OPERATING IDEAS

From Production, Electrical and Mechanical Men

Current Value May Increase In A.C. Holding Coils

Differences in the actions of a.c. and d.c. holding coils are exemplified in the experience of a Southern mine where, not long ago, the undervoltage holding coil of a newly installed starting compensator in a tipple burned out a number of times. At first it was thought that the manufacturer had furnished the wrong coil and was continuing to furnish wrong coils for replacement. Then it was discovered that the coil was connected so that it remained across the line after the compensator tripped instead of being connected across the motor leads. This, however, did not explain why the coil burned out, for apparently it was designed for continuous duty across the line. The correct explanation, however, was that the coil took a much higher current when the armature was not in the holding position.

The d.c. holding coil takes the same current whether the armature is up or down, but the impedance of an a.c. coil is much greater when the armature is up and the magnetic circuit is completed. The coil is designed to withstand only the current that flows when the magnetic circuit is completed, and therefore will be damaged by increased current if left energized when the armature is down.

Added Drum Made Locomotive Into Stationary Hoist

Needing a hoist to handle railroad cars at the tipple at the Rich Creek No. 2 mine of the Gauley Mountain Coal Co., Jodie, W. Va., and unable to discover suitable equipment by a check of surplus material, mine officials turned their attention to a spare 5-ton electric locomotive (30-in. gage) which contained motors and control equipment for driving a hoist. Direct-current drive was necessary because the mine is powered with that type of current, which is generated at a local plant. Instead of removing the motors and using them in fitting up a separate machine, the entire locomotive was turned upside down and made into a hoist at small expense by adding a drum driven from gears meshing with the axle gears.

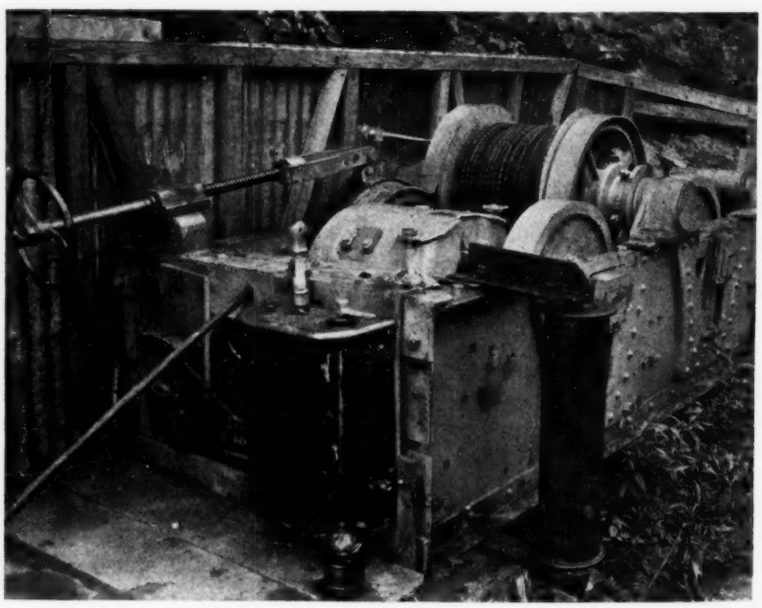
The two tandem-hung, 35-hp., Type WO65 motors were turned to make room for the rope drum in the center. This drum was constructed from a locomotive axle on which two locomotive gears were mounted to mesh with the regular axle gears. Drum flanges were made by welding two $\frac{3}{8}$-in. circular plates to the drum gears. Spacers $\frac{1}{2}$ in. thick were inserted between the flange plates and the gear faces to prevent the flanges rubbing the faces of the axle gears. One flange was provided with a hole through which the rope is passed for clamping to a drum-gear spoke. Hardwood was fitted around the axle to provide a drum core 12 in. in diameter.

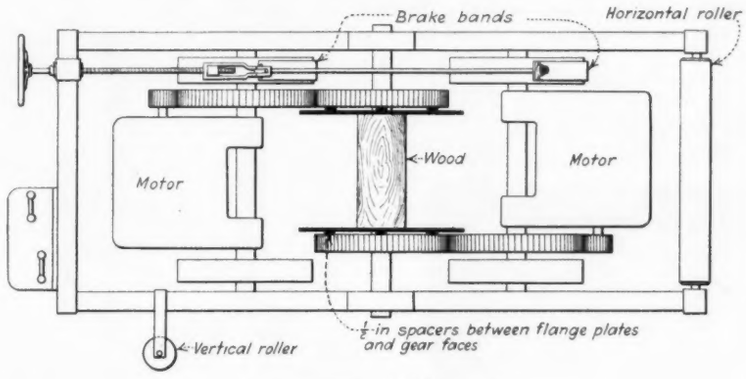
Tires were removed from all four wheels and the two cores on one side were utilized as brake drums. Each is fitted with a half-circle brake band anchored at the bottom. The locomotive handwheel and screw parts were utilized for the brake-control mechanism. Equalization is provided for by a link on the top of the band nearest the control end.

Solid journal bearings were applied to replace the half brasses, because the weight of the motor and axle themselves was not sufficient to hold the assembly down on a hard pull. The principal reason for turning the locomotive over was to facilitate removing the axles when repairs become necessary. The regular Type R86 controller was utilized in the converted machine, but, of course, was mounted in a reversed position with respect to the locomotive frame.

In several months of use this hoist has proved an excellent piece of equipment for the duty. Its pulling capacity

Hoist in Operating Position.



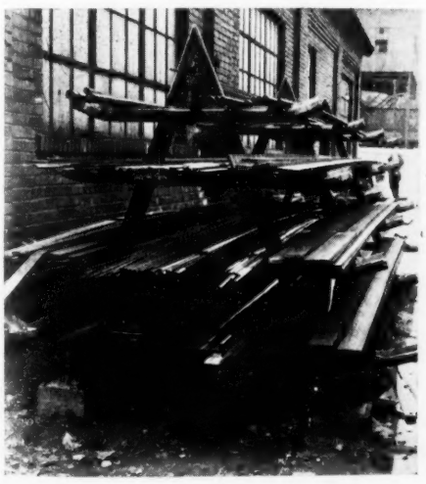


Arrangement of Hoist Parts.

is greater than was contemplated and, as usually is the case, its application has been extended far beyond the original duty of shifting empty cars only, being used at times to good advantage in moving loaded cars.

Rack for Storing Steel Made From Used Rail

Used 30-lb. rail was utilized in the construction of a neat rack for storing the stock of bar and round steel and structural shapes at the central repair shop, No. 1 mine, Pond Creek Pocahontas Co., Bartley, W. Va. This rack and its load of steel is shown in the accompanying illustration. It consists of three separate A-frames set in concrete. The crossbars—four per frame—are welded to the legs, the base flanges of the leg rails first being notched with a cutting torch to provide a more secure bearing and welding surface.



Crossbars Are Welded to the A-Frames.

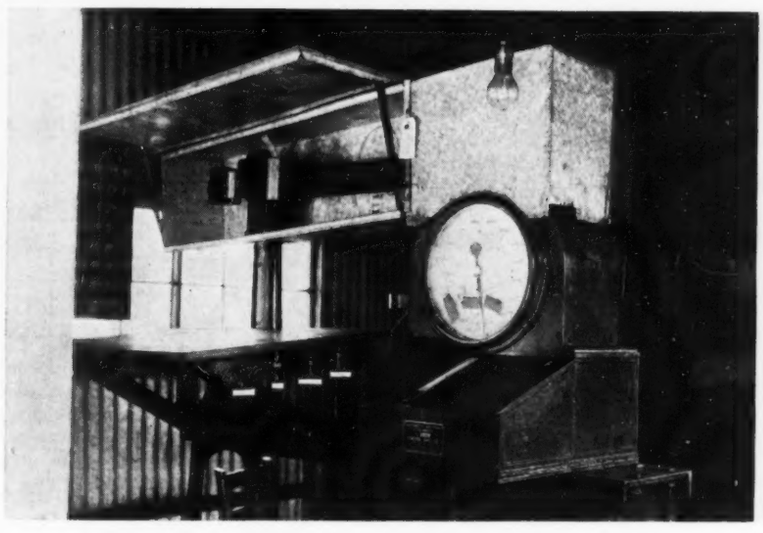
Ends of the crossrails are bent upward to prevent pieces of stock accidentally slipping off. Lack of room in the shop required that the rack be placed outside, and W. F. Hossfield, chief electrician and master mechanic for the company, states that it is intended to equip it with a canopy top before winter to prevent accumulations of snow and ice.

Night Weigh Boss Eliminated In Two-Shift Operation

Reduction in operating cost through the elimination of the night weigh boss where the tipple is operated two shifts is the essence of a plan developed by L. M. Brown, weigh boss, No. 2 mine, Gay Coal & Coke Co., Mt. Gay, W. Va. Successful operation of the plan was made possible by the use of Streeter-Amet automatic weight indicators and recorders. The beam of the Buffalo scales and the three attachments to the recorder were inclosed in a sheet-metal box with two openings—a long door which swings upward to permit any necessary work on the scale beam and a small door opening backward to allow balancing the recorder. After the recorder is balanced and the tare weight is set, the two doors are closed and sealed by the weigh boss and the checkweighman, the former using a company sealer and the latter a United Mine Workers' sealer. No one is allowed to enter or adjust the scales in any way except in the presence of both the weigh boss and checkweighman.

A long check hook is furnished the night dumper. This hook is curved at the lower end and has two small holes punched in each end. The checkweighman places his seal on the lower end of the hook. The night dumper then places checks pulled during the night and at the end of the shift places the company seal on the upper end of the hook, thus preventing any meddling. As the cars pass over the scales, the weight automatically is recorded. On the following day, the weigh boss and the checkweighman remove the tape from the recorder and enter the weights, matching them with the checks as they are removed from the hook. Marking up can begin at either end of the tape, so long as the checks are removed from the corresponding end of the hook. The night

Scale Beam and Recorder Attachments Are Inclosed to Make the Presence of the Weigh Boss and Checkweighman Unnecessary in Weighing on the Night Shift.



Opportunity

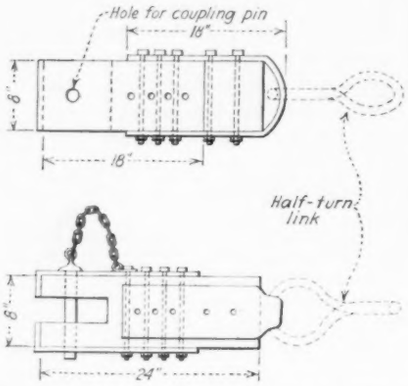
Contrary to the old saw, opportunity frequently knocks more than once, as, for example, in these pages. Month by month, practical ideas are presented here for operating, electrical, mechanical and safety men. This continuous fund of items gathered throughout the coal-mining industry is a service offered the man who may be faced with some problem outside of the general run of his experience or who may be searching for some means of improving the department with which he is connected. Another opportunity also is available through these pages—the opportunity to pass on your cost-saving and safety methods. Cash and credit await you, so send in your ideas. *Coal Age* will pay $5 or more each for those that are acceptable.

dumper is furnished with blank checks, and if a car comes out without a check he places a blank on the hook where the regular check would come.

With this system, weighing is carried on as perfectly as if the weigh boss and checkweighman were on duty throughout the night, the company is spared the expense of a night weigh boss and the local union is relieved of the expense of a night checkweighman.

Insulating Hitching

For use on man trips, Arnold Curry, Wyano, Pa., suggests the insulating hitching shown in the accompanying illustration. The hitching is made of a solid 8x8x24-in. wood block with ½- or ¾-in. strap-iron fittings. These fittings



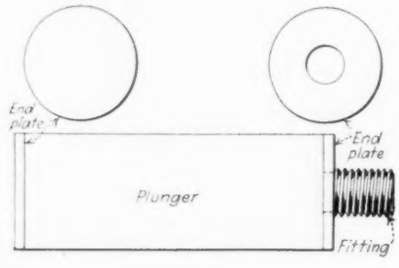
Construction Details, Insulating Hitching.

are bolted onto the block as shown, the bolt holes being positioned so that the bolts pass between each other, thus preventing any possibility of contact. Staggering the bolts also is insurance against the fittings pulling out in case of heavy strains.

Welding Cut Cost of Plungers For Special Pump

Damaged plungers on a special pump for handling strongly acid water at a mine of the Gibraltar Coal Mining Co., Kentucky, brought up the serious problem of replacement cost, writes Bennie Dukes, machinist, Central City. The pump in question was cement-lined and was equipped with porcelain plungers, which cracked in service. To reduce the cost of replacing the plungers, it was decided to make new ones in accordance with the accompanying sketch. Each plunger was constructed of a 5-in. pipe sawed off the right length. End plates were welded on as shown, one end plate

Construction Details of Pump Plunger.

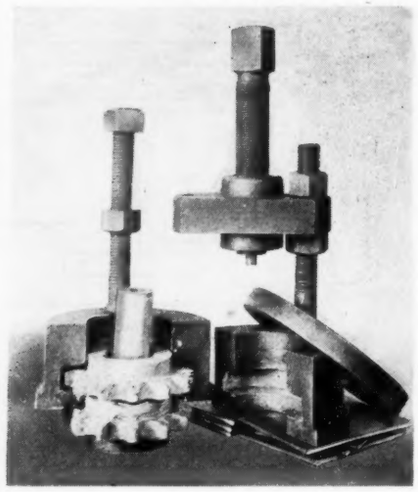


Covering the Plunger With Gas by Gas Welding.

being threaded to receive the fitting illustrated. The plunger and the end plate opposite the fitting were then covered with brass, using a welding torch. Cost of the completed job was very low, Mr. Dukes remarks, and service was satisfactory.

Sprocket Puller

To save time and also prevent possible damage due to heating and hammering, the sprocket puller shown in the accompanying illustration has been developed by the repair department at the Zeigler No. 1 mine of the Bell & Zoller Coal & Mining Co., Zeigler, Ill., for removing the No. 1519 sprockets on Joy loading machines. John J. Lyons, safety engineer, furnishes the



Details of Sprocket Puller.

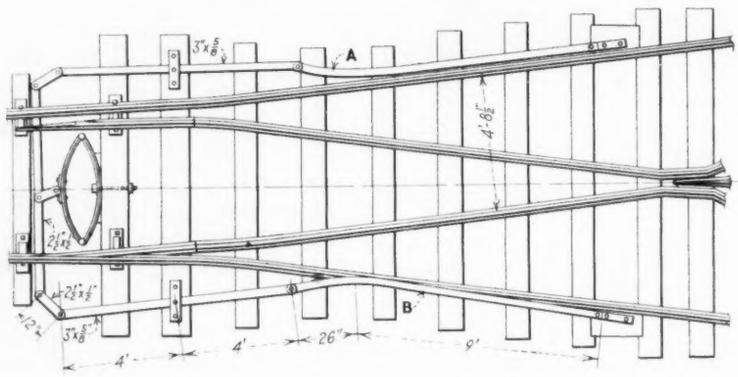
description. The puller is built in two halves, which are held in place around the sprocket by the ring lying on the right half of the puller in the figure. The shaft pusher is made of 1¼-in. stock, which has been found of ample size and strength for the service.

Switch Thrown by Monitor On Tennessee Incline

The switch-throwing device shown in the accompanying sketch, which is operated by the down-coming monitor, has been in successful use on the Block Coal Co. incline, Block, Tenn., for a number of years, writes A. W. Evans, chief mine inspector, Division of Mines, Nashville. Length of the incline is in excess of 6,000 ft., and it is built with three rails above and two rails below the parting, necessitating a switch to shift the monitors to the proper rails.

The latches are thrown automatically by the down-coming monitor, which strikes one of the two tripping bars projecting out over the top of the rail (*B* in the position shown in the illustration), thus throwing the latches for the incoming monitor and locking them in position so that it will take the right track ascending.

Diagram of Monitor-Operated Switch-Throwing Mechanism.



WORD from the FIELD

Proposes $1,000,000 Campaign To Protect Coal Trade

Accumulation of a $1,000,000 fund to be used in newspaper advertising to tell the real story and the ultimate effects on employment of the government hydro-electric program was suggested by C. B. Huntress, president, Appalachian Coals, Inc., at the meeting of the International Railway Fuel Association in Chicago, Sept. 18. Materialization of "the fantastic TVA dreams," he declared, would mean that thousands of mine and railroad workers would lose their jobs and that scores of communities dependent upon the mining industry would be wrecked through government use of taxpayers' money "to furnish an uneconomic energy source to displace power generated from coal."

The TVA program again was brought into the courts when a number of stockholders of the Alabama Power Co. filed suit in the State court at Athens, Ala., to enjoin the utility from carrying out contracts for TVA distribution and control in fourteen northern Alabama towns. The suit, which also was directed against TVA and these fourteen towns, alleges that the contract for the sale of the utility interests involved was made under duress. Prior to the filing of this suit, the Montgomery County Circuit Court, in a ruling handed down Sept. 4, ordered the Alabama Public Service Commission to cancel its order approving the sale of power-company properties in the northern part of the State on the ground that the Commission had failed to give the customary 30 days' notice to interested parties.

Alabama coal interests are vigorously protesting the proposal that housing projects in Atlanta, Ga., use gas for heating. The situation was discussed with E. C. Mayette, engineer in charge of the PWA projects, which involve about 1,200 apartments, at a meeting of Appalachian Coals, Inc., officials, affected retailers and representatives of Division III code authority. Mr. Mayette promised that no final decision would be reached without further investigation.

New Preparation Facilities

New contracts and construction of preparation-plant facilities were reported as follows in September:

Boone County Coal Corporation, Sharples, W. Va.; contract closed with Jeffrey Mfg. Co. for major additions to existing tipple, including screening tower, structure and housing for jigs and delivery and mixing conveyors. Two Jeffrey-Traylor double-deck vibrating screens, 100 tons per hour capacity each, will separate feed into 1¾x¾-in. nut and ¾x0-in. slack; four 30-ton-per-hour vibrating rescreen feeders will deliver the nut coal from continuous surge hoppers to the jigs.

Carter Coal Co., Coalwood, W. Va., has contracted with Jeffrey Mfg. Co. for

a belt conveyor and belt loading boom to handle an additional size in its existing five-track tipple.

Delta Coal Mining Co., Carrier Mills, Ill.; contract closed with Link-Belt Co. for coal tipple and washery with a capacity of 400 tons per hour.

Island Creek Coal Co., Holden, W. Va.; contract closed with Robins Conveying Belt Co. for installation of semi-portable type Chance cleaning equipment, including one 8-ft. Chance cone, sand and water pumps and scalping, sizing and dewatering screens; capacity 90 to 100 tons per hour of 4x⅜-in. coal; to be completed this month.

Jamison Coal & Coke Co., Farmington, W. Va.; contract closed with Robins Conveying Belt Co. for additions and alterations to tipple at No. 8 mine, including belt conveyors for handling 2x0-in., lump and slack; belt-and-bucket elevator for slack, scraper conveyor for nut, 6x14-ft. double-deck Gyrex screen with a capacity of 350 tons per hour, 4x10-ft. double-deck Gyrex screen with a capacity of 160 tons and 30x36-in. adjustable crusher.

Knox Consolidated Coal Corporation, Bicknell, Ind.; contract closed with Hydrotator Co. and Stephens-Adamson Mfg. Co. for air-sand cleaning equipment and auxiliary machinery to handle 25 tons per hour of 1¼x2-in. screenings. Installation to be completed about Nov. 1.

New River & Pocahontas Consolidated Coal Co., Capels, W. Va.; contract closed with Link-Belt Co. for installation of Simon-Carves washery.

Old Hickory Block Coal & Clay Co., Brazil, Ind.; contract closed with Morrow Mfg. Co. for reciprocating plate feeder, mine-run scraper conveyor, three grade shaking screens, loading booms and rescreen conveyor; capacity, 100 tons per hour; to be completed Oct. 1.

Peabody Coal Co., Harco, Ill.; contract closed with Allen & Garcia Co. for installation of dedusting equipment at No. 47 mine; equipment will include three Algar dedusting units for extracting dust from ⅛x0-in. coal at the rate of 150 tons per hour.

Slab Fork Coal Co., Slab Fork, W. Va.; contract closed with Link-Belt Co. for Simon-Carves washery with a capacity of 100 tons per hour.

Research Group to Meet

Stockholders of Bituminous Coal Research, Inc., will meet at the Mayflower Hotel, Washington, D. C., Oct. 25, according to John C. Cosgrove, head of the organization and chairman of the annual meeting committee of the National Coal Association, which will hold its convention at the same place on Oct. 26 and 27.

Coal Prepares to Fight Higher Rate Plea

Coal interests, rallying under the leadership of the National Coal Association, will be in the forefront of the fight of shippers against the proposed general increases in freight rates. Lumber and agricultural interests also promise to oppose the railroad plea when the petition of the carriers, filed with the Interstate Commerce Commission late in August, comes up for hearing. The coal industry takes the position that the proposed increases will hurt both the miners and the producers by encouraging the use of substitute fuels and that, even where coal retains the business, the railroads will lose an increasing volume of tonnage to competitive forms of transportation. Freight rates on bituminous coal now average 66 per cent of the delivered price of the fuel. Class I railroads, in their petition to the Commission, stated that they are facing an annual increase of $293,000,000 in wages and the cost of material and supplies, and seek to recoup approximately $170,000,000 of this increase through higher freight rates.

The carriers propose the following increases on anthracite and bituminous coal, lignite and briquets: 3c. per ton on rates up to 75c.; 5c. on rates between 76c. and $1; 10c. on rates between $1.01 and $1.25; 15c. on rates between $1.26 and $1.50; 20c. on rates between $1.51 and $1.75; 25c. on rates between $1.76 and $2, and 30c. on rates over $2. The same increases are proposed on coke rates up to $2 per ton with 35c. on rates between $2.01 and $2.25; 40c. on rates between $2.51 and $2.75; 40c. on rates between $2.76 and $3, and 45c. on rates in excess of $3 per ton.

Lake-cargo rates on coal for ultimate delivery within the United States would carry a single increase of 30c., divided between carriers transporting the coal to the lower lake docks and railroads hauling it from Lake Superior and west-bank Lake Michigan docks to the ultimate destination. Tidewater rates on bituminous coal moving to New England territory also would carry a single increase of 30c. Existing differentials on all-rail bituminous coal are to remain unchanged. Some rates between points in Rocky Mountain States and North Pacific Coast States are excepted from the proposed advances.

No Federal Fuel Relief

There will be no federal fuel relief plan, such as was handled last year through the Federal Surplus Relief Corporation, this winter, according to Harry L. Hopkins, head of the Federal Emergency Relief Administration. Mr. Hopkins has notified all State relief agencies that emergency fuel requirements must be taken care of through the funds available to the State organizations.

Retail Code Authority Breaks With NRA; Correlation Still Vexes

RESIGNATION of the entire membership of the national code authority for the retail solid-fuel industry on Sept. 1 in protest against what the authority, headed by Roderick Stephens, of New York, termed the lackadaisical methods of enforcement and the assumption by NRA of the power to modify the code without previous notice to or the consent of the industry was the outstanding and most sensational development in coal-code affairs during the past month. Three days later G. A. Lynch, administrative officer for NRA, announced that the resignations had been accepted. Pending the selection of a new national code authority to represent the industry, the retail solid-fuel code was placed under the jurisdiction of the recently created General Code Authority of NRA, headed by Dr. Willard Hotchkiss, president, Armour Institute of Technology.

The action of the militant retail coal merchants was foreshadowed by a report of the code authority to NRA on Aug. 23 in which NRA was sharply criticized for its order of April 14 placing all code assessments on a voluntary basis and not changing this ruling until three months later, failure to enforce compliance and NRA handling of "floor cost" determinations under the emergency price-fixing provisions of the code. "Compliance difficulties were anticipated," stated the report, "but it was never expected that the enforcement machinery under the jurisdiction of NRA would so completely fail to back up the efforts of code agencies to enforce compliance on chiselers and others who have deliberately violated the provisions of this Code."

The right to establish "floor cost determinations" to prevent destructive price competition, continued the report, "represents the consideration which induced the industry to grant the substantial increased wage rates and reduced hours of labor. Without such provision, there would have been no acceptance of this code on the part of the industry, which fact is of record." But, the provision for prompt approval or disapproval of these determinations by the divisional administrative appointee, subject to the right of the administrator to approve, modify or disapprove, was, it was argued, substantially modified by the administrative order of July 25 instructing all administrative divisional code representatives to delay approval of cost determinations until they had been reviewed by the research and planning division of NRA and approved, disapproved or modified by the administrator.

The conflict moved to a crisis a few days later when the code authority declined to recognize a memorandum of policy on determination of emergencies and fixing lowest reasonable costs prepared by the division of research and planning as binding. Counsel for the authority declared that the memorandum was in effect an amendment to the code to which the authority had not subscribed and upon which no public hearings had been held and that, in the absence of notice and public hearing, the code could be amended only by the President of the United States. Notice was then served upon the coal men by Divisional Administrator Houston that if the protest of the code authority was found to be legally sound, the provisions of the code covering emergency declarations and determinations of lowest reasonable costs would be suspended.

"The last hope for effective results," said the letter of resignation, "has just been destroyed by the announcement that the provisions of this code may be modified at will by NRA without prior notice to or consent of the industry. It is our view that the code and the act provide a specific and orderly method of modification, and the administrator may not on his own initiative arbitrarily impose amendments. The interpretation of the code today, in the light of NRA memoranda which are being given the effect of amendments, is at complete variance with its intent and effect as originally approved. Vacillating policies, constant delays in securing decisions vital to administration and disregard of clear understandings originally entered into with this industry at the time the code was approved make it evident that there is no hope for effective administration and enforcement. To continue to attempt to function under these conditions is impossible."

Prior to the appointment of the General Code Authority as "custodian" of the retail solid-fuel code, NRA informed all divisional code authorities that it would proceed with the determination of costs in all areas where emergencies exist "in exactly the same manner heretofore followed." At the same time NRA also announced that "a misunderstanding" of its plans had arisen as a result of the bulletin issued by the resigned national code authority in which threats to stay the emergency provisions of the code had been mentioned. "NRA has no intention of taking any action toward staying any of the provisions of your code nor changing them in any way so long as they are properly and honestly administered in the public interests." Promise also was made that all price questions would be handled with "all reasonable dispatch."

Retail coal merchants won a victory when NRA on Sept. 12 announced that the application of the Cotton Textile Institute on behalf of 359 mills in the Southern and Northern textile fields who sell coal to their employees "at cost, and at less than cost if all handling charges are considered," for exemption from the retail solid-fuel code was denied. The Industrial and Labor Advisory boards and the legal division of NRA recommended unconditional denial of the petition; the Consumers' Advisory Board recommended exemption from code assessments and the research and planning division recommended that the mills be exempted from making daily reports. These limitations were not accepted by NRA in making its ruling.

Correlation problems continue to vex bituminous operators, but the situation, due largely to the plan promulgated by Divisional Administrator Adams several months ago requiring interchange of proposed price changes between affected districts prior to official approval, is not so acute as it was a year ago. Reports that Southern high-volatile producers were planning to establish delivered prices for Michigan territory have been the subject of meetings of operators of that State within the past fortnight. A proposal to absorb 35c. per ton on coal moving into Illinois and Indiana, embodied in the September price schedule of the Southern high-volatile fields, was disapproved by Washington.

Roderick Stephens

Chairman of Code Committee Which Resigned in Body

Correlation of prices between different divisions and subdivisions in Divisions IV and V, covering all States west of the Mississippi River except Iowa, which is in Division II, was discussed at a meeting in Chicago on Sept. 10. The meeting was called by Deputy Administrator Ellis. Price relationships on coal moving into the Chattanooga market from the southern Appalachian, Harlan and Tennessee-Georgia districts were considered at a meeting in Chattanooga on Aug. 28. At a meeting in Cincinnati Sept. 15, a reduction of 25c. in southern Appalachian district prices to Chattanooga was permanently disapproved by Mr. Ellis on a showing that heavy reductions in shipments into that market in recent months were due to industrial conditions and truck competition. A proposed Executive Order, instituted late in September in the legal division of NRA for the enforcement of the Adams plan for the correlation of prices and to make the plan applicable to all five divisions operating under the bituminous code, was temporarily held up because the Department of Justice already is studying the question of price relationships. Under date of Sept. 5, Mr. Adams advised all code authorities in Division I that the correlation procedure outlined in his letter of June 8 (*Coal Age*, July, 1934, p. 291) would be continued for an indefinite period.

The code authority for Division V has petitioned the administration to amend Art. III of the bituminous code to permit oper-

ators to work six days per week for not more than 20 weeks in any calendar year. The proposal also has been indorsed by the code authority for Southwestern subdivision No. 4. The code authority for Southern subdivision No. 1 of Division I has approved a proposed amendment for the establishment of statistical bureaus in each division and/or subdivision under the management and control of the code authority. In the form suggested, the proposed amendment eliminates the Presidential member of the code authority as the controlling agent (see *Coal Age*, September, 1934, p. 364) and reverts to the plan originally advocated when the proposed amendment was first discussed. Southern subdivision No. 2 of Division I has adopted a resolution to the effect that unless NRA proceeds at once with the prosecution of four cases which have been submitted to it, the code authority will notify the operators that NRA is not going to take the necessary action to enforce compliance with the code.

Divisional Administrator Adams, according to Washington reports, has announced that he will resign from NRA effective Oct. 1. He sailed for Europe on Sept. 22. It is rumored that Benedict Crowell, at present Presidential member on the Ohio subdivision code authority of Division I, may be named as his successor.

NRA has approved the appointment of a trade practice complaints committee for the western Pennsylvania subdivision of Division I. The personnel of this committee is as follows: C. A. Hosford, Jr., formerly president, Butler Consolidated Coal Co., chairman; R. Templeton Smith, vice-president, Pittsburgh Coal Co.; H. M. Wassum, vice-president, Henderson Coal Co.; M. W. McClane, president, McClane Mining Co.; W. D. Rankin, vice-president, Lincoln Gas Coal Co.

A suggestion that the bituminous mining, wholesale and dock codes be combined into one vertical code has provoked so much opposition that further consideration of the plan by NRA has been indefinitely postponed. NRA has assured protestants that no such consolidation would be undertaken in advance of a public hearing on the proposal.

A.S.T.M. Committee Busy

A number of projects confront the A.S.T.M. committee (d-5) working on coal and coke under the chairmanship of A. C. Fieldner, chief engineer, experiment stations division, U. S. Bureau of Mines. An agglutinating value test for coal has been published for information and, while this method shows satisfactory check results in the same laboratory, there has been some lack of agreement between different laboratories. The causes for this are to be studied.

Experimental work is under way to develop an adequate method for determining slacking properties of coal—that is, a method to measure disintegration when exposed to the weather. Investigations on accuracy of various methods of sampling coal will be carried out. In view of the expense involved in conducting coal-sampling experiments, it is extremely difficult to obtain the data required to determine the most economical method of sampling coals containing different amounts of impurities and differing in size. By economical is meant the smallest gross sample that may be taken to get a sample within a predetermined degree of accuracy.

Coal grindability tests are being made at six different laboratories, using four laboratory methods, on a series of five coals varying from a friable semi-bituminous coal to a hard anthracite. The purpose of this work is to determine which of these methods is best adapted to measure the grindability of coal in connection with commercial pulverization of coal for powdered-coal installations. The committee hopes to draft methods of testing coal to determine resistance to breakage on handling.

New Deal Under Scrutiny By Industrialists

Business groups are becoming increasingly active in studying the Roosevelt recovery and reform program with a view to crystallizing business sentiment on the direction legislation and administration should take. A meeting of the durable goods industries at Hot Springs, Va., Sept. 14-15, decided to continue the work of the Durable Goods Industries Committee in analyzing the forces which are interfering with employment and in emphasizing that "reemployment in the durable goods industries is still the keystone of recovery." The National Association of Manufacturers also has created a committee to study the relations of government to industry and to formulate a program reflecting the views of industrialists on this relationship. H. R. Hawthorne, vice-president, Pocahontas Fuel Co., is a member of the committee, which is headed by James W. Hook, president, Geometric Tool Co.

Hugh S. Johnson

The oft-repeated rumor that General Hugh S. Johnson would end his connection with NRA became an actuality on Sept. 25, when President Roosevelt announced the acceptance of the resignation of the General as National Recovery Administrator. In asking to be, relieved, General Johnson stated that under the proposed reorganization of NRA his "job seems altogether superfluous." No official announcement has been made on this reorganization, but press dispatches from the Summer White House at Hyde Park, N. Y., have indicated that the new NRA would separate executive, policy and legal functions into a tridivisional setup patterned after the plan of the federal government.

A preliminary report by the committee on NRA of the Chamber of Commerce of the United States, made public Sept. 22, declared that NIRA should neither be reenacted nor extended. If any new legislation is passed, it should be limited in its application to businesses engaged in or affecting interstate commerce and should include definite exemption from the anti-trust statutes and other laws which might be considered in conflict with the new legislation. Each industry should be permitted to formulate its own rules of fair competition, subject only to approval or veto by the government agency, and rules so approved should be enforceable against all concerns in the industry. Opportunity also should be given for members of an industry to enter into an agreement on fair competition, subject to government approval, which would be enforceable only against the subscribing members. Both classes of codes or agreements should be subject to termination on reasonable notice by either the industry or the government.

The committee report also called for the earliest practicable amendment of the labor clauses imposed in codes by Sec. 7 (a) of NIRA. "It should be made unmistakable that the collective bargaining which is contemplated is bargaining with representatives of all groups of employees that desire to act through spokesmen, and that neither the right of a minority group to deal collectively nor the direct right of individual bargaining is precluded. It should be equally explicit that the right of employees to choose their own representatives is to be free from coercion from any source. The condition that employment is not to be made dependent upon membership in one type of employees' organization should be extended to membership or non-membership in any type of labor organization."

William L. Sweet, treasurer, Rumford Chemical Works, is chairman of the Chamber committee of eleven which drafted the report. J. D. A. Morrow, president, Pittsburgh Coal Co., is a member of the committee.

Oppose Waterway Project

Southern coal operators appeared at a hearing of the Board of Engineers for Rivers and Harbors at Washington, D. C., Sept. 17, in opposition to the proposal to construct a canal to connect Lake Erie with the Ohio River. Such a canal, it is contended, would give operators in the Pittsburgh area an all-water haul to Lake Erie and increase the rate differentials against Southern producers. The project already has been approved by the district and division engineers of the board.

Must File Plan by February

Plans for reorganization of the Colorado Fuel & Iron Co., now in receivership, must be filed with the U. S. District Court at Denver, Colo., not later than Feb. 1, 1935, according to a ruling handed down on Sept. 16 by Judge Symes. The court also appointed Arthur Roeder, trustee for the C. F. & I., to the position of trustee for the Colorado Industrial Co., a subsidiary of C. F. & I.

Safety Work Jeopardized by Curtailment Of Bureau Funds, Says Committee

THE SAFETY of thousands of workers in the coal and other mineral industries is being jeopardized by the sharp curtailment of federal efforts to protect miners from accidents and disasters as a result of the steady reduction in funds allotted to the U. S. Bureau of Mines, according to the report of the special committee appointed by the American Mining Congress to study the situation. This committee, headed by Eugene McAuliffe, president, Union Pacific Coal Co., declares that the reduction in appropriations has dealt a heavy blow to the federal mine safety program initiated a quarter of a century ago.

In the report, made public last month, the committee points out that nine of the eleven mine-rescue cars have been taken out of service, that the health division of the Bureau, operated in cooperation with the U. S. Public Health Service, has been abandoned and that the scientific research program on safety problems has been halted. With appropriations for the current fiscal year the smallest since 1920, the Bureau has been compelled to discharge or furlough more than 500 employees. At the same time, demands upon the Bureau service have expanded because much work has been transferred from other governmental agencies to the Bureau during the last fourteen years.

Enforced curtailments, the committee points out, have particularly affected training in first-aid and mine-rescue work. The scope of this training also has been greatly reduced. The number of men receiving these instruction courses has dropped from an annual average of approximately 100,000 to 50,000 and there is doubt whether this latter total will be reached this year. While several States and many of the larger mining companies have undertaken training programs of this general type, men familiar with the situation insist that the program still needs the assistance of the federal experts to coordinate the nation-wide efforts, to extend advances in the field of basic research, and to provide service for the smaller mining companies and their employees.

Another result of the reduced appropriations has been that the experimental mine of the Bureau at Bruceton, Pa., where much valuable research has been done on the causes and effects of mine explosions, has been placed on a greatly restricted schedule which will permit its use for only a few weeks this year. This mine, without counterpart in the world, has enabled the Bureau of Mines to conduct tests which could not have been made in a commercial mine or in the confines of a laboratory. Much of the credit for the decrease in the number of mine explosions is ascribed to these experiments.

Discontinuance of the work of the health division of the Bureau has ended the pioneering studies and advanced investigations which already have resulted in the elimination of many dangers to the health of miners and employees in many other industries. Notable among these studies and investigations are those relating to the breathing of harmful dusts, the effect of high temperatures and humidity upon efficiency and health, and the toxicity of gases encountered in mining and metallurgical work.

On the basis of official estimates, the survey of the committee states that the number of fatalities in the coal fields has been reduced by more than 1,000 per year since the Bureau of Mines started its safety work. An annual average of 50,000 non-fatal accidents, it is estimated, have been prevented during the past 24 years. Marked increase in metal-mining safety also is indicated. Activities under the safety program, the committee declares, must be continued if they are to be fully effective. The report also stresses that new generations of supervisors and employees must be given training and must be made familiar with safety practices as they enter the mining field.

Maintenance Problems Up At Institute Meetings

In a talk on maintenance of mining machines and locomotives at Mt. Hope, W. Va., Sept. 20, before the New River & Winding Gulf Mechanical and Electrical Institute, John S. Beltz, chief engineer, mining department, Jeffrey Manufacturing Co., pointed out a precaution necessary in the maintenance of new equipment, the design of which may include heat-treated alloy steel parts such as bolts and studs. Unless the maintenance man is aware that such parts are of the high-strength materials he may replace them with parts of ordinary steel which may have but one-third the strength. Or, not realizing that heating robs the material of a large percentage of its strength, he may for some reason, use a torch on it. Maintenance of equipment begins with inspection; cleanliness is the next most important item; grease must be kept away from commutators and windings.

L. W. Scott, electrical engineer, General Electric Co., Charleston, W. Va., presented a paper on general maintenance of substation equipment. Short cuts and simplified methods for adjusting power factor, voltage, parallel operating characteristics, and interpole strength, were set forth and illustrated for both synchronous motor-generators and converters. E. S. Maclin, president, New River State College, Montgomery, W. Va., announced the offering of a new extension course covering applied electricity to coal mining.

The same speakers appeared on Sept. 21 at an organization meeting of an electrical and mechanical section of the Kanawha Valley Mining Institute, Montgomery, and on Sept. 22 at Bluefield, at a meeting of the Pocahontas Electrical and Mechanical Institute.

Permissible Plate Issued

One addition was made to the list of permissible equipment by the U. S. Bureau of Mines in August. The approval (No. 603) was issued to Thomas A. Edison, Inc., on Aug. 14 and covers a special electric lamp for intermittent service "for use of mine officials only."

ACI Combustion Engineers Launch Fuel Program

A program for monthly meetings for interchange of information on combustion problems was launched at a meeting held under the auspices of the fuel engineering division of Appalachian Coals, Inc., at Cincinnati, Ohio, Sept. 12-13. Engineers from 38 companies attended the first meeting and appointed standing committees on engineering publications, small stokers, chemical treatment of coal and the study of the ultimate analysis of ash. These committees will report at the next meeting, set for Oct. 15.

The conference, presided over by J. E. Tobey, manager of the fuel engineering division of ACI, discussed the services which can be most profitably undertaken by the division for the stockholders and agents of ACI and proposals for the protection of ACI coals from encroachment of coals from competing districts, oil, natural gas and hydro-electric power. A questionnaire was prepared and approved for use in a special survey of steam plants. The meeting also recommended that the sales agency undertake the development of fundamental information on the physical, chemical and combustion characteristics of all ACI coals by seams. R. F. Stilwell, Consolidation Coal Co., summarized recent natural-gas developments in Michigan. C. B. Huntress, president; B. R. Gebhart, assistant to the president; and A. L. Brown, head of the marketing division of ACI, also addressed the meeting.

Sinclair Interests Enter Illinois Field

The Sinclair Coal Co. interests of Kansas City, Mo., which control several operations in the Southwest, have organized the Delta Coal Mining Co. to develop stripping acreage in Saline County, Illinois. The coal to be uncovered, in the No. 5 seam, is near Carriers Mills and averages 52 in. in thickness. A contract already has been let for a tipple and washery, with a raw feed capacity of 400 tons per hour and a washery capacity of half that amount.

Welsh Disaster Kills 271

An explosion followed by a fire in the Gresford colliery, Wrexham, Wales, Sept. 22 killed 271 miners, according to estimates made by local authorities two days after the disaster. Rescue efforts proved futile and the mine was sealed after several explosions were reported the day following the accident, when it was necessary to withdraw the rescue squads.

Lewis Renews Demand for 30-Hour Week; Suicidal for South, Says Huntress

ADOPTION of a 30-hour week with no reduction in base rates of pay was demanded by John L. Lewis, international president, United Mine Workers, in a Labor Day pronouncement. Such a program, he insisted, offered the only feasible way out of large-scale unemployment and burdensome taxation for relief. Adoption of such a program, retorted C. B. Huntress, president, Appalachian Coals, Inc., "would sound the death knell" for many mines in the South.

"Organized labor, equally with industrialists," stated Mr. Lewis, "holds to the institution of private property and to the virtue of private initiative. It distrusts the regimentation of life, but feels that the requirements of social justice and common welfare are not wholly problems of charity but of politics.

"Is it not plain," he asked in stressing existing unemployment and the necessity for relief, "that work must be distributed by shortening the work day and the work week? Is it not also obvious that unemployment reserves or insurance must be set up in industries to protect the human factors against want in seasonal shutdowns and cyclical depressions? Fundamentally this is a cost item which each industry may reasonably be expected to bear. Why should an industry turn out its employees at periods it deems not profitable to use them and let the private or public charities take care of them until they are called back to work?

"As to the six-hour day and the five-day week, the condition today reinforces the need for the passage of the Black-Connery bill. All the promises and predictions that industry would take up the slack of employment have failed. It is evident that industry, by mechanization and economies in labor, has thrown millions on the scrap pile, where they will stay unless the hours of labor are adjusted. And this should be done without putting the burden on those employed by reducing their wages. To reduce the wages of those now working in order to employ more is to lower the whole wage structure upon which our industrial and agricultural markets depend. Where will the money come from? Where does it come from now? If these are industrial obligations, then industry must bear them, even if it involves readjustment of market realization."

Further evidence that organized labor plans to press the fight for the shorter work-week is seen in the action of the American Federation of Labor in querying candidates for Congress on their attitude upon this and other planks in the labor platform for social legislation. Federation headquarters has bluntly told aspirants for election or reelection that refuge in silence will be construed as hostility to the labor program.

"With Southern bituminous mines fighting with their backs to the wall to retain markets," asserted Mr. Huntress, "the Black-Connery bill would, on the basis of a thorough study made by the operating men, sound the death knell for many mines in those fields. Everyone familiar with the coal industry knows that the six-hour day is impracticable. As a matter of fact, the seven-hour day was adopted only as a temporary measure, and many operators believe on economic grounds that the eight-hour day should be reinstated.

"The six-hour day means a reduction of 15 per cent in tonnage and an increase of 30c. a ton in production costs. The biggest drawback from the miners' standpoint is that the net result would be to throw many miners out of employment for the very good reason that a 30c. increase in the price of coal would seriously curtail the markets in competition with oil and natural gas. While the six-hour day, of course, would also govern production costs in the Indiana and Illinois fields, the increase would not be so great there because the Illinois and Indiana mines are more highly mechanized, which means that labor is not an important factor in production costs.

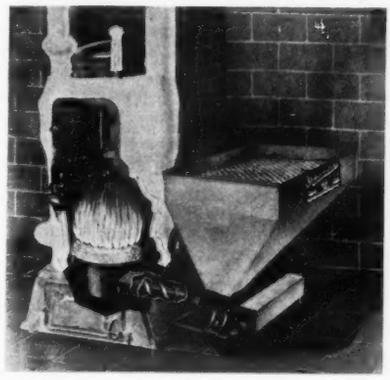
"A drop of 1,000 tons in production wipes out the livelihood of from 15 to 20 persons. How many thousands of persons would be added to the bread lines if this additional burden were placed on the Southern mines is not a pleasant subject of conjecture. It becomes apparent that everyone connected with the Southern coal industry would suffer terribly if the Black-Connery bill were enacted — the miners, the mine owners and the railroad men."

Stoker Program Developed By Dickson & Eddy

To promote consumer satisfaction with anthracite and combat substitute fuels, Dickson & Eddy, New York, have developed a stoker merchandising plan built around the selection of the "Stokermatic" burner for No. 1 buckwheat and rice, for sale by its dealers. The company also announces "Stokermatic anthracite" in these sizes, especially prepared for maximum efficiency in domestic stokers.

Two sizes of Stokermatic burners are offered for steam, hot-water, vapor and hot-air boilers and furnaces: Type A, rated at 450 sq.ft. of steam radiation, and Type B, 750 sq.ft. A third size, rated at 1,000 sq.ft., is being developed. Hopper capacity is 350 lb., and ashes with the standard model are deposited in the existing furnace pit. "Pit-type" installations providing for special ash receivers and removal facilities are available at extra cost. Average power cost is said to be less than $1.50 in winter months, and prices range as low as $198.50 for the Type A burner, including all necessary automatic and hold-fire controls. De luxe, totally inclosed models with an increased hopper capacity also are available.

Standard-Type Stokermatic Burner



The burners will be sold exclusively through Dickson & Eddy dealers, with agencies limited to one dealer in a community except in congested residential areas and larger cities. Distribution, according to the company, is based on correct engineering, proper installation and uniformity of fuel, and dealers are expected as a general rule to handle installation and service. When necessary, Dickson & Eddy engineers will install the first few units for any particular dealer, pending organization of local facilities, and the company also stands ready, when requested, to cooperate in arranging for installation by a reliable local plumbing, heating or electrical contractor. In any event, the customer is in contact only with the dealer, who guarantees the mechanical performance of the stoker for one year.

Safety Meets Held

With 5,000 people in attendance and 43 teams participating, the fifth annual sectional safety meet of the New River and Winding Gulf Coal Mining Institute was held at the Black Knight ball park, Beckley, W. Va., Aug. 24, under floodlights. First and second places in the first-aid contests went to the Stotesbury and Helen teams of the C. C. B. Smokeless Coal Co., respectively. Third honors were won by a team from the Price Hill Colliery Co. First place among colored teams was awarded to a group representing the Prudence mine of the New River Co.

First place in the contests featuring the ninth annual safety meet of the Coal River Mining Institute, held at Madison, W. Va., Sept. 3, was won by a team of the Nellis Coal Corporation. Second and third places, respectively, went to teams representing the Eunice mine, Chesapeake & Ohio Ry. fuel department, and the American Eagle Collieries Co.

Stoker Sales Up

July sales of stokers, as reported by 83 manufacturers to the Bureau of the Census, were 1,210—an increase of 97 over the same month last year. Sales of Class 1 (residential) stokers for the first seven months of 1934 totaled 4,427, and of Class II (apartment-house and small commercial installations), 545. For the corresponding period last year the totals were 2,891 and 221, respectively. Stoker sales for the first seven months show a 48 per cent gain over 1933; shipments of oil burners for the same period increased only 21 per cent.

Peabody Reopens Mine

Operations at the Woodside mine No. 53 of the Peabody Coal Co., in the central Illinois district, were resumed on Sept. 13. The mine had been closed down for several weeks while repairs were being made.

Unrest Brought to Low Ebb by Labor Board; Anthracite Strikers Resume Work

LABOR BOARD decisions played an important part in bituminous labor developments last month. In the anthracite field, several hundred men returned to work after shutdowns lasting two months.

In a complaint of the Progressive Miners of America against Mine 21 of the Interstate Coal Co., at West Frankfort, Ill., it was alleged that the mine was closed in March, 1933, and reopened in November of the same year by H. M. Rea as lessee from the receiver and that Rea announced that he had a contract with the United Mine Workers for operation of the mine. The complainants alleged that old employees were not taken back. Division II Labor Board ruled that the men who were employed when the mine closed in March, and who made application to return to work when the mine reopened, should be reemployed and also held that the contract with the United Mine Workers was valid, denying a petition of the Progressives for a referendum of old employees. In regard to a complaint that the lessee had failed to pay full wages since resuming operations, the Board held that as the mine is working under contract with the United Mine Workers, the employees should take the grievance up with that organization.

When the issue was presented as to whether the miners are entitled to a deficiency when two men are put in a room neck to turn a room the Board found in a case involving the Beck Coal & Mining Co. that the work referred to had been completed before the code took effect, and that rights gained through adoption of the code are not retroactive. In the case of a worker who hauled water, slag and waste material in the Hallett & Frump mine, the Board ruled that his status was that of an individual contractor and that it had no power to direct that he be taken back, but if taken back, he should not replace any of nine other men who by order of the Board were given the right to positions in the mine when and if needed.

In a matter involving hours per day and days per week for hoisting engineers, the Board gave the opinion that existing contracts were not abrogated by the code or the executive orders and were changed only to the extent agreed upon by the parties to the contracts. If modified to substitute a seven-hour workday for an eight-hour day, as set forth in existing contracts, no further modification could be required.

A machine crew of the Central Service Co., Des Moines, Iowa, asked a tonnage rate instead of a day rate. The Board cited the Des Moines agreement, however, in ruling that if either operator or miners do not wish to make a change from the day rate to a tonnage rate, they could not be compelled to do so. District 13, United Mine Workers, and the Wayne and Appanoose Coal Operators' Association submitted to the Board for arbitration the question of whether the 10c. increase per ton as provided in Executive Order of March 31, 1934, was applicable to mine-run or screened coal, where rates were fixed on the screened-coal basis. The Board held the 10c. increase applicable to mine-run and announced that 11c. was the proper advance on screened coal.

An attempt to reopen Red Ray mine of the United Electric Coal Cos., near Freeburg, Ill., with workers affiliated with the United Mine Workers was prevented when pickets of the Progressive miners staged a demonstration Sept. 8. The company has four other mines in Illinois, all manned by United Mine Workers. Red Ray mine was closed April 1, 1933, when the company refused to sign a contract with the Progressives. A committee representing 60 former employees of the mine has filed a petition in the federal court at East St. Louis asking that their rights under the collective bargaining clause of the Recovery Act be recognized.

In regard to the contract of the Sahara and Wasson mines, in Saline County, Illinois, with the Progressive union, which Division II Labor Board adjudged to be valid on Jan. 13, 1934, with the provision that its decision be in force for a provisional period of six months, the Board reaffirmed its ruling and stated that the contract remains in force until set aside by mutual action of the contracting parties or until its expiration, or unless set aside by due process of law.

Provisions for redistricting the State and adding two board members were included in resolutions adopted at the second constitutional convention of the Progressive union, held at Gillespie, Ill., Sept. 22. Under the new provision nine members, with the three resident officers, will compose the executive board. Another resolution that was passed relates to labor's rights under Sec. 7(a) of NRA. It provides that "P.M.A. begin an educational program to counteract false propaganda, demand that enforcement of the law be invested in the constituted authorities only," and protests against "the activities of certain 'civic' groups and their methods of intimidation."

The executive board of the United Mine Workers has issued an announcement that a reward of $10,000 will be paid by the union for information leading to the arrest and conviction of "persons guilty of attempting to murder 316 members of the United Mine Workers on July 7 by destroying with dynamite or other explosives the topworks and airshaft of the Capitol mine, located at Springfield, Ill."

In Indiana, nearly 400 workers at the King's shaft of the Princeton Mining Co., Princeton, went on strike Sept. 8, shortly after the company had received a contract to supply coal for several State institutions. Some months ago a strike was called at this mine—the largest shaft operation in the State—in opposition to loading coal on a night shift. When the company had submitted the proposed change to Division II Labor Board the Board held that there could be no dispute until the operator put into operation the suggested change, and then the agreement between employer and employees must be utilized to settle any dispute arising. After a long period of idleness, the right to load coal at night was acknowledged.

When asked to pass upon the plan of arbitration in District 11 of Indiana, where the United Mine Workers asserted that there was inadequate machinery to negotiate disputes to a conclusion, Division II Labor Board found that there is no present machinery to carry disputes to a settlement if the union and coal producers fail to agree. The Board pointed out, however, that it had no authority to require any particular form of arbitration.

Two negro miners were killed when a column of union miners marched to the Porter mine, Adamsville, Ala., Sept. 16. The shooting was the outgrowth of a demonstration by the miners in an attempt to persuade employees of the Porter mine to join the local union.

After two months' shutdown, while factions of the United Mine Workers and the United Anthracite Miners of Pennsylvania struggled for control, differences between the East Boston Coal Co., Luzerne, and its employees were ironed out, according to an announcement Sept. 21. More than 400 miners were affected. Laurel Run colliery and Laflin and Pine Ridge breakers of the Hudson Coal Co. also were scheduled to resume operations late in the month after two months' idleness. Although the shutdown of the Hudson plants was due largely to market conditions, the resumption of work will have the effect of lessening labor unrest.

Decisions in three grievances filed by the United Mine Workers in District 9 were announced by James A. Gorman, umpire of the Anthracite Conciliation Board. In the case of contract miners employed in the Suffolk section of the Maple Hill colliery, in the Orchard vein, the umpire ruled that the men should be paid in accordance with rates provided in the Suffolk colliery rate sheet; that the size of the Suffolk colliery mine car is 129.2 cu.ft., including topping; and that for every car of larger cubical content the complainants shall be paid a proportionate increase in wages. The decision is retroactive to the time the grievance was first raised. Another grievance originated in a dispute over wages between the Hazle Brook Coal Co. and workers at its Mid Valley colliery. Mr. Gorman ruled that "the weight of evidence establishes that $0.63 per car is the rate to which the miners are entitled for loading coal during the period covered by the grievance." Motor patchers at the Mid Valley colliery were upheld in a protest against the practice of the company in charging 5c. a day for the use of electric lights, when, it was contended, it had been the custom in the past to furnish lights free of charge.

Coming Meetings

American Institute of Mining and Metallurgical Engineers, Coal Division; Pennsylvania State College, State College, Pa., Oct. 19-20.

National Coal Association; annual meeting, Mayflower Hotel, Washington, D. C., Oct. 26-27.

Illinois Mining Institute; 42d annual meeting, Hotel Abraham Lincoln, Springfield, Ill., Nov. 2.

Harlan County Coal Operators' Association; annual meeting, Harlan, Ky., Nov. 21.

Power and Mechanical Engineering Exposition; Grand Central Palace, New York City, Dec. 3-8.

Committee of Ten to Hold Annual Meeting

The annual meeting of the Committee of Ten of the Coal and Heating Industries will be held some time in November. This decision was reached at a meeting held in Chicago Sept. 12. All persons interested in the committee's activities and in the marketing and utilization of solid fuels will be invited to attend the November meeting, which is being planned by a committee consisting of T. A. Marsh, president, Midwest Stoker Association; R. A. Miller, National Retail Coal Merchants' Association; and Homer R. Linn, Institute of Boiler and Radiator Manufacturers.

The meeting last month, which was presided over by John C. Cosgrove, chairman of the committee and representative of the National Coal Association, instructed the secretary to prepare a general resolution for signature of all organization delegates condemning the competition of the federal government with private industry in the power field. The position taken by the National Coal Association in opposing expenditure of government funds for the erection of hydro-electric plants was indorsed. Members of the committee pledged their support in requesting the A.S.M.E. to include a paper on heating with coal stokers as part of the session on domestic heating at the annual meeting of the mechanical engineers in New York in December.

Barbour Mine Starts Up

The Barbour mine of the Alamo Coal Co., in the Walsenburg (Colo.) district, resumed operations the first week in September, giving employment to approximately 100 men. About half the men had been on federal relief rolls.

Personal Notes

A. H. Beddoe, formerly vice-president and general sales manager, Breese-Trenton Mining Co., has been elected president and general manager of the Illinois-Pocahontas Coal Co., operating in Bond County, Illinois. Mr. Beddoe will have headquarters in St. Louis, Mo.

Marc G. Bluth has been appointed executive secretary of the Committee of Ten of the Coal and Heating Industries, with headquarters at Chicago. Mr. Bluth, who has been assistant secretary of the organization since 1931, succeeds Oliver J. Grimes, who gave up his active connection with the group last year when he accepted a position with Secretary of War Dern.

E. L. Carr, formerly assistant sales manager, Bell & Zoller Coal Co., Chicago, has been made assistant to the president of the company.

Harry Goulston has been transferred from the superintendency of the Stanton colliery of the Glen Alden Coal Co. to the superintendency of the Buttonwood colliery of the same company, vice W. F. Powell, retired.

W. J. Heatherman, at one time chief of the department of mines of West Virginia and also with the Davis Coal Land Co., has been appointed superintendent of the mine operated by W. H. Green near Bemis, W. Va.

J. William Wetter
Now in Charge of
All Madeira-Hill Operations

J. H. Hillman, Jr., president of the Hecla Coal & Coke Co., Emerald Coal Co. and the Thompson-Connellsville Coke Co., subsidiaries of the Hillman Coal & Coke Co., Pittsburgh, Pa., has resigned as chairman of the board of the Peoples-Pittsburgh Trust Co.

William E. Lewis, of Sandoval, Ill., has been made top foreman of the No. 5 mine of the Centralia Coal Co., at Centralia, Ill.

R. S. McVeigh, for more than a quarter of a century vice-president of the Island Creek Coal Co., with headquarters at Cincinnati, Ohio, has resigned, effective Sept. 1. Mr. McVeigh will continue, however, as a member of the board of directors of Island Creek and its affiliate, the Pond Creek Pocahontas Co.

J. T. Millington, mine foreman at the Inman shaft of the Buttonwood colliery of the Glen Alden Coal Co., has been promoted to the position of superintendent of the Loomis colliery, vice G. P. Troutman, who has been made general superintendent of the southern division of the company.

P. R. Paulick, who was formerly on the engineering staff of the Hanna Coal Co., in charge of time-study work, is now associated with the Princeton Mining Co., Princeton, Ind., in a similar capacity.

Hayden D. Richards, mine foreman, Bliss colliery, Glen Alden Coal Co., has been appointed mine foreman of the Inman shaft of the Buttonwood colliery, vice J. T. Millington, who has been made superintendent of the Loomis colliery of the same company. Daniel R. Thomas, section foreman at Bliss, succeeds Mr. Richards as mine foreman.

R. H. Sherwood, president, Sherwood-Templeton Coal Co., was elected president of the Indiana Coal Producers' Association at the organization's recent annual meeting at Terre Haute. Fred S. McConnell, vice-president, Enos Coal Mining Co., was made vice-president, and Michael Scollard, who has served as secretary-treasurer since the association was launched, was reelected.

William D. Thomas has been appointed superintendent of the No. 4 and Gaylord collieries of the Kingston (Pa.) Coal Co. Thomas Handly succeeds Mr. Thomas as foreman of the No. 1 shaft.

Grayson P. Troutman, formerly superintendent of the Loomis colliery, has been promoted to the post of general superintendent of the southern division of Glen Alden Coal Co., vice Edward Griffith, who was recently advanced to the position of vice-president and general manager, vice the late S. D. Dimmick.

J. William Wetter, general manager in charge of bituminous operations of Madeira, Hill & Co., has had his jurisdiction extended to cover the anthracite operations as the result of the recent retirement, because of poor health, of E. H. Suender, vice-president in charge of anthracite operations.

Coal Division to Discuss Important Problems

Operating, management, wage and safety problems will be the chief topics of discussion at the 1934 fall meeting of the Coal Division of the A.I.M.E., to be held at Pennsylvania State College, State College, Pa., Oct. 19-20. The following papers and discussion have been tentatively scheduled:

"Sealing Abandoned Bituminous Mines," J. W. Paul, Pittsburgh, Pa., with discussion by E. A. Holbrook, University of Pittsburgh, and F. H. Waring, Ohio State Department of Health.

"Trends in Underground Lighting," Graham Bright, Mine Safety Appliances Co., with discussion by Carroll A. Garner, Jeddo-Highland Coal Co.; C. A. Gibbons, Susquehanna Collieries Co.; B. H. Stockett, Weston Dodson & Co.; T. G. Fear, H. C. Frick Coke Co.; and D. D. Dodge, W. J. Rainey, Inc.

"Gas Evolution and Rate of Face Advance," N. P. Rhinehart, chief, West Virginia Department of Mines, with discussion by Robert Currie, anthracite district, U. S. Bureau of Mines, and C. E. Lawall, director, School of Mines, West Virginia University.

"Mechanism of Combustion of Solid Fuels," Martin A. Myers, coal research laboratory, Carnegie Institute of Technology, with discussion by Ralph A. Sherman, research engineer, Battelle Memorial Institute; H. J. Rose, Mellon Institute; and J. B. Morrow, Pittsburgh Coal Co.

"Machine Mining on the Pitch," George Jones, Haddock Mining Co., with discussion by Eli T. Conner, consulting engineer, Scranton, Pa., and L. E. Young, Pittsburgh Coal Co.

"Scientific Management Applied to Mining," Charles E. Bedeaux, president, Charles E. Bedeaux Co., Paris, France, with discussion by F. S. McConnell, Enos Coal Mining Co.

"Engineering and Operating Data Which Should Be Considered in Wage Negotiations," J. William Wetter, Madeira, Hill & Co., with discussion by Dr. Young; R. L. Ireland, Jr., Hanna Coal Co.; S. A. Scott, New River Co.; R. E. Taggart, Stonega

Coke & Coal Co.; L. W. Householder, Rochester & Pittsburgh Coal Co.; Milton H. Fies, DeBardeleben Coal Corporation; W. L. Affelder, Hillman Coal & Coke Co.; Charles O'Neill, Peale, Peacock & Kerr, Inc.; W. P. Tams, Gulf Smokeless Coal Co.; A. S. Wilson; W. E. E. Koepler, Pocahontas Operators' Association; T. F. McCarthy, Clearfield Bituminous Coal Corporation.

Obituary

J. T. GRAY, JR., superintendent, Gray Mining Co., Bulan, Ky., was killed Aug. 30 when he came in contact with a motor wire while inside the mine. Mr. Gray was the son of J. T. Gray, president and general manager of the company.

WILLIAM L. HENERY, 50, a mine inspector for the U. S. Coal & Coke Co., died in the hospital at Lynch, Ky., Aug. 31 following an appendicitis operation several days earlier.

ALBERT J. NASON, 56, who organized the Nokomis and Nason coal companies in Illinois several years ago, died at his home in St. Paul, Minn., Aug. 29. Mr. Nason, who came into prominence in the Illinois field during the World War period, had not been active in the mining business for some time.

EDWIN W. OVERBEY, secretary-treasurer of the Leckie Coal Co., Columbus, Ohio, died suddenly while visiting his old home town, Boydton, Va., on Aug. 21. Mr. Overbey had been associated with the Leckie interests for a score of years.

EDWARD GEORGE SMITH, 55, president, Sanderson Mining Co., Irwin, Pa., passed away on Aug. 26 after an illness of several years. Mr. Smith was at one time superintendent of the Westmoreland Coal Co.

ROBERT TEEL, 48, superintendent of the colliery of the Upper Lehigh Coal Co., Hazleton, Pa., died in a hospital Aug. 29 from injuries received when struck by a truck working at the strip pit of the company.

JOHN P. WHITE, 64, former international president, United Mine Workers, died in a hospital in Des Moines, Iowa, Sept. 21, following an operation. After his retirement from the union presidency in 1918, Mr. White served for a number of years as organizer and union arbitrator. One of his most notable achievements in conciliation work was his success in cooperation with the late W. L. A. Johnson, representing the operators, in restoring orderly and harmonious relationships in the Southwest as one of the two members of the Southwestern Interstate Joint Commission.

John P. White
Former President, United Mine Workers, Dies

Coal-Mine Fatalities in August Dip From July Rate

During August, 1934, there were 87 deaths caused by accidents at coal mines of the United States, according to information furnished the U. S. Bureau of Mines by State mine inspectors. Production during the month amounted to 31,108,000 short tons; thus the fatality rate was 2.80 per million tons of coal produced. This rate (which is subject to slight revision) reflects an improvement over the rate for August, 1933, which was 3.05, and also over the revised rate for July, 1934, which was 3.59 per million tons.

Bituminous mines were responsible for the deaths of 73 men in the mining of 27,490,000 short tons of coal, giving a death rate of 2.66 per million tons. This compares with the July record of 88 deaths, a production of 25,280,000 tons and a rate of 3.48, and with the August, 1933, record of 97 deaths, 33,910,000 tons mined and a rate of 2.86 per million tons. The August, 1934, rate would have been 2.04 but for a major disaster in Virginia which caused 17 deaths.

Anthracite production was 3,618,000 short tons of coal, in the course of which work 14 men lost their lives, thus giving a death rate of 3.87 per million tons, as compared with a revised rate of 4.36 in July, when 15 men were killed in mining 3,443,000 tons, and a rate of 4.55 in August, 1933, when 20 men lost their lives in mining 4,396,000 tons.

FATALITIES AND DEATH RATES AT UNITED STATES COAL MINES, BY CAUSES

Cause	Bituminous: Number killed	Bituminous: Killed per million tons	Anthracite: Number killed	Anthracite: Killed per million tons	Total: Number killed	Total: Killed per million tons
January-August, 1933						
Falls of roof and coal	291	1.395	78	2.561	369	1.544
Haulage	99	.475	16	.525	115	.481
Gas or dust explosions:						
Local explosions	16	.077	8	.263	24	.101
Major explosions	...	.....	..	.....	...	.....
Explosives	12	.057	6	.197	18	.075
Electricity	35	.168	4	.131	39	.163
Machinery	11	.053	1	.033	12	.050
Surface & miscellaneous	41	.196	19	.624	60	.251
Total	505	2.421	132	4.334	637	2.665
January-August, 1934						
Falls of roof and coal	322	1.368	94	2.360	416	1.511
Haulage	95	.404	18	.452	113	.411
Gas or dust explosions:						
Local explosions	8	.034	10	.251	18	.065
Major explosions	17	.072	..	.....	17	.062
Explosives	20	.085	12	.301	32	.116
Electricity	37	.157	3	.076	40	.145
Machinery	12	.051	2	.050	14	.051
Surface & miscellaneous	62	.263	36	.904	98	.356
Total	573	2.434	175	4.394	748	2.717

All figures are subject to revision.

Industrial Notes

W. L. SCHWENINGER has been appointed Western sales manager of the fleet division of Federal Motor Truck Co., with headquarters at Chicago.

POOLE FOUNDRY & MACHINE CO., Baltimore, Md., has acquired sole ownership of all domestic and foreign patents covering Poole all-metal-gear lubricated flexible shaft couplings formerly owned by Poole Engineering & Machine Co.

L. S. STEPHENS, vice-president, has been elected president of Stephens-Adamson Mfg. Co., Aurora, Ill., vice D. P. PIERSEN, who succeeds W. W. STEPHENS as chairman of the board.

LINK-BELT CO., Chicago, announces the appointment of the Allegheny Equipment Corporation, 1218 Grant Building, Pittsburgh, Pa., as authorized distributor for L-B crawler shovels, cranes, draglines and locomotive cranes.

CHICAGO PNEUMATIC TOOL CO. has moved its Birmingham, Ala., district office from 1829-31 South Second Ave., to 211 South 20th St.

SALES and engineering of the products of the Whitcomb Locomotive Co., a subsidiary of Baldwin Locomotive Works, Philadelphia, Pa., were taken over by the parent company on Sept. 17. Baldwin has established an internal-combustion locomotive section in its sales department in charge of H. H. Perry, formerly vice-president and general manager of the Whitcomb Co., with H. V. Huleguard, formerly sales manager of Whitcomb, as assistant. Manufacture of Whitcomb products will be continued at the Whitcomb plant in Rochelle, Ill.

AMERICAN LUMBER & TREATING CO., Chicago, specializing in Wolman salts preservative timber treatment, is constructing plants at Franklin, Va., and Wauna, Ore. Products of the Camp Mfg. Co. will be treated at the Virginia plant; products of the Crossett Western Lumber Co. at Wauna. The company already is operating plants at Crossett and Fordyce, Ark.

MARLIN-ROCKWELL CORPORATION, Jamestown, N. Y., has opened a factory branch at 550 Polk St., San Francisco, Cal., in charge of James Ross Brown. This branch also will serve as San Francisco headquarters for the M-R-C Bearings Service Co., distributor of M-R-C bearings for automotive and industrial replacement purposes.

WHAT'S NEW
IN COAL-MINING EQUIPMENT

Cutter Bit

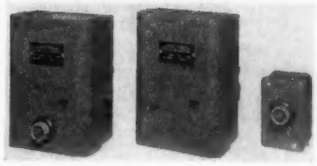
T. M. Stephens, Michigan City, Ind., offers a patented double-ended mining-machine bit said to have given satisfactory service in tests under hardest cutting conditions. The bit proper is made of high-grade, heat-treated alloy steel, and the holder, which fits any standard-type cutter-chain block, is sturdily constructed without setscrews. Automatic self-gaging is claimed for the combination of bit and holder.

Right to Left — Bit; One Half of Holder With Bit in Recess; Other Half of Holder; Bit in Holder; and Bit and Holder in Standard Chain Block.

Use of this bit, it is asserted, eliminates the labor employed in sharpening the usual type and reduces the labor and cost of transporting bits to and from the working place. The angles of the bit-point lines are so related to the direction of chain travel that ample clearance is afforded to prevent rounding of the point, it is asserted. To change cutting ends or renew bits the usual chain-block setscrew is loosened and the holder removed by tapping it with a hammer. The two halves of the holder then fall apart, thus loosening the bit.

Motor Starters

A new line of motor starters designed to prevent accidental starting and also to take full advantage of the motor's capacity without burning it out is offered by the Lincoln Electric Co., Cleveland, Ohio. The starters are of the across-the-line type and fully meet underwriters' requirements, according to the company. The safety feature consists of a concentric green start button inside of which is mounted the red stop button. The latter projects above the start



button so that accidental contact moves only the stop button. Once the motor is stopped, it can be restarted only by pressing the recessed start button with the fingertip.

Inverse-time-limit protection, it is said, permits full use of the motor's capacity by allowing it to carry a small overload for a long time or a heavy overload for a short time. Immediate starting upon current resumption is assured by a low-voltage release with two-wire control. The following types are available: XLA—3 and 5 hp., 110 volts; 3, 5, 7½ and 10 hp., 220, 440 and 550 volts; XLB—7½ and 10 hp., 110 volts; 15, 20, 25 and 30 hp., 220 volts; 15, 20 and 25 hp., 440 volts; and 15 and 20 hp., 550 volts; XLBB—30 hp., 440 volts; and 25 and 30 hp., 550 volts.

Wire Lubricator

Ohio Brass Co., Mansfield, Ohio, offers the new O-B trolley-wire lubricator, consisting of a standard universal pole head, a special harp and the lubricating mechanism, which includes a lubricant tank with a capacity of 1½ pt. The tank, in which is mounted a roller, is pivoted in the harp and is free to rotate within certain limits. As the roller revolves, the lubricant is rolled onto the wire. A brush at the rear end of the lubricator wipes off excess lubricant and at the same time brushes the liquid up on the sides of the wire. A wearing plate at the front of the tank bears against the wire and keeps the tank in a horizontal position as it moves along the trolley, and a cover prevents the liquid from escaping due to the centrifugal force developed by the roller, and also protects the roller when passing through frogs and crossovers. An adjustable wiper at the front of the tank under the wearing plate regulates the quantity of lubricant applied to the wire. The lubricator is mounted on a separate non-current-carrying pole installed on the locomotive or a mine car behind the locomotive.

Ohio Brass Co. also supplies a special lubricant which it describes as containing a considerable percentage of high-grade, finely divided graphite suspended in a fluid in which are dissolved special bonding constituents. Upon application, the fluid evaporates in 60 seconds, it is asserted, leaving a thick coat of graphite which will not

flake or rub off. Resistance to moisture or water, absence of resistance in the current path and non-collection of dust and dirt which might set up abrasive action are among the advantages claimed for the lubricant.

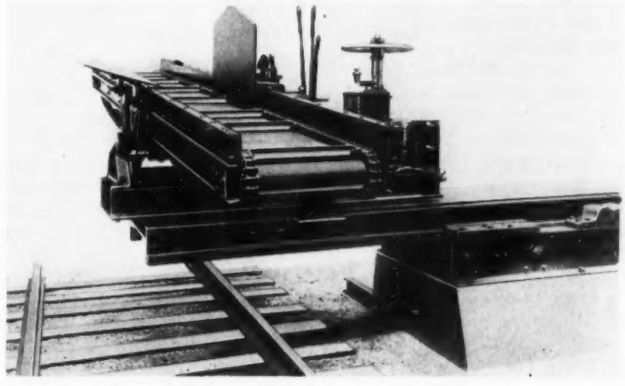
Box-Car Loader

Ottumwa Box Car Loader Co., Ottumwa, Iowa, offers the Model "MDL" medium-duty scraper-line box-car loader, which it describes as a medium-priced unit for use where installation of larger equipment would not be justified. Operation of the new loader, according to the company, is substantially similar to the older Ottumwa variable-speed scraper-line loader, and is featured by one-man control; complete power operation, including movement into and out of the car and raising, lowering and shuttling of the conveyor; and six operating speeds.

The loading conveyor is 15 ft. long and 23 in. wide (inside), and in operation the "MDL" loader can enter or leave the side door from either angle. Thus, it is pointed out, loading begins at once in the first end of the car entered and is continuous until the conveyor is withdrawn. The conveyor is lowered to the floor when loading is started, and is raised as the coal builds up, at the same time being swung from side to side so that rolling and throwing is reduced to a minimum. As the ends of the car are filled, the conveyor is mechanically shuttled away from the pile.

Construction features stressed by the company include: base frame designed for mounting on a permanent foundation, on various types of trucks or other portable mountings or upon a turntable for loading on two opposite trucks; in-and-out frame in various lengths to suit individual clearance conditions; and a shuttling system which employs no mechanical parts, shuttling being accomplished by applying a simple band brake which retards the movement of the conveyor chain and in turn moves the conveyor through the tilting frames in which it rests. A simple brake rigidly locks the conveyor in any position.

A 5-hp. gearmotor is employed for moving the loader into and out of the car; loading and other movements are powered by a 10-hp. variable-speed motor permit-



ting six speeds for continuous operation in either direction. Weight of the Model "MDL" loader is approximately 8,000 lb. complete with electrical equipment.

Gate Valve

Kennedy Mfg. Co., Elmira, N. Y., has placed on the market a heavy standard bronze gate valve designed for working pressures of 150 lb. per square inch steam and 250 lb. per square inch water, oil or gas. Designated as Fig. 23, the new

valve, according to the company, includes the following features: large bonnet hex placed close to the body to make entire valve more rigid and also to facilitate removal of the bonnet and stem assembly when close clearances prevail; stem of tough bronze with an unusually large number of contact threads and a flexible connection between the stem head and disk, making stripping of the threads almost impossible; deep stuffing box with specially selected high-graphite molded packing rings; bronze gland and heavy packing nut; substantial non-heating, non-slipping handwheel; and heavy pipe end hexes. These valves are available in a complete range of sizes up to 3 in.

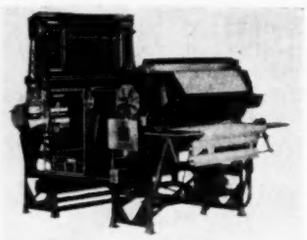
Blasting Machine

Atlas Powder Co., Wilmington, Del., offers the "Twin Fifty" blasting machine with a capacity of 100 caps. The new machine is an adaptation of the Atlas No. 3 blasting machine with a specially designed shunt winding capable of firing fifty 30-ft. copper-wire electric blasting caps. Through the use of a special double switch and a third binding post, the unused current in the No. 3 machine can be used to fire a second series of 50 caps. The only additional equipment required is an extra leading wire, according to the company, and the firing of the second series of caps follows the first so closely that the time interval is indistinguishable to the ear. This interval, it is pointed out, may be of advantage in certain kinds of blasting. The change in the machine in no way interferes with its ability to fire a single series, it is said.

Blueprinting Machine

C. F. Pease Co., 813 North Franklin St., Chicago, announces the new Pease Model "11" continuous blueprinting, washing and drying machine, said to feature low initial, operating and maintenance cost. Complete Model "11" equipment consists of a blueprinting machine, washing unit and pot-ashing and drying unit. A clutch allows operation of the blueprinting machine separately, and it also may be purchased separately.

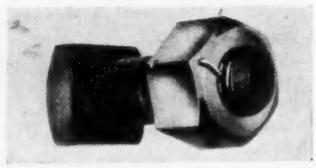
The standard machine is furnished in one size for paper up to 42 in. wide (a special machine can be built on order for paper up to 54 in. wide). Design provides for wiring for operation on either 220 volts a.c. or d.c. by a variable-speed ½-hp. motor. Three new Pease "Super-Actinic" lamps provide



a printing speed ranging from 4 to 12 ft. per minute on direct or 60-cycle alternating current. A special gear shift provides high and low operating speeds and also is designed with a neutral point, and additional speed regulation is provided by a special hand-operated dial direct-connected to a rheostat. Gas or electrically heated dryers can be supplied, and the machine can be equipped for making negatives.

Locknut

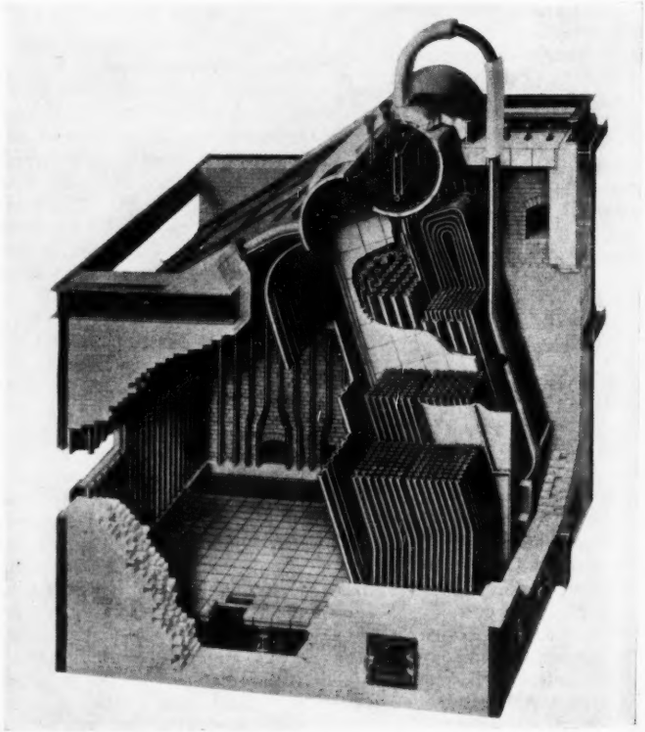
An automatic locknut fitting any standard thread and said to be simple in design and highly efficient is offered by the Automatic Nut Co., Inc., Chrysler Building, New York. Built integrally with the nut is a locking pin of chrome-vanadium rustless steel with a high percentage of nickel. When applying the nut, this pin is engaged by the thread of the bolt, following it down until the nut is seated. The pin engages the thread at a slight angle, thus, it is said, establishing a perpetual lock which is proof against vibration and shock. To remove the nut, it is turned in the opposite direction, throwing the pin over in the other direction, after which it follows the threads off the bolt. The nut, according to the company, is absolutely foolproof and can be put on and taken off over and over, the same as any ordinary nut, without impairing the bolt threads.



Integral-Furnace Boiler

Babcock & Wilcox Co., New York, has announced a new boiler unit which it states is designed to provide a completely coordinated unit comprising a two-drum boiler, water-cooled furnace, burners for gaseous, liquid or pulverized solid fuels, with provisions for using combinations of these fuels and for quick conversion from one to another, and, when needed, a superheater, economizer and air heater. The unit, according to the company, is particularly adaptable where operation at high nominal ratings with high final steam temperatures and efficiency is desired.

Arrangement of the boiler proper, with inclined tubes entering an upper and lower drum and with the furnace paralleling the drums and separated from the rows of tubes by a furnace wall, instead of the conventional arrangement with the boiler set over the furnace, makes installation easy where headroom is limited, it is said. The new unit also is said to remove the handicaps of first cost, operation and maintenance involved in the large furnace volume required for pulverized-coal firing with other types of boilers of the same capacity, as water-cooled furnace walls can be applied at a fraction of the cost.

Welding Bench

Oster-Williams, 2057 East 61st Place, Cleveland, Ohio, has added a pipe-welding assembly bench to its line of pipe-threading and handling equipment. The bench, according to the company, is capable of handling all sizes of pipe up to 12 in., lining it up accurately and holding it in position for tacking, fittings, flanges and branches at any angle. For longer lengths, an extension bench can be supplied. An adjustable elevator, which can be used any place on the bench or extension, controls vertical alignment. Accurate angle alignment is obtained by setting elevator at desired angle. Weight of the main bench is 700 lb. and length is 8 ft. Extension weight is 300 lb.; length, 6 ft.